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SOUTH PACIFIC COMMISSION

quarterly Bulletin

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The South Pacific Commission

The South Pacific Commission is an advisory and consultative body set up in 1947 by the six Governments responsible for the administration of island territories in the South Pacific region (Australia, France, the Netherlands, New Zealand, the United Kingdom and the United States of America).

The Commission's purpose is to advise the participating Governments on ways of improving the well-being of the people of the Pacific island territories. It is concerned with health, economic and social matters. Its headquarters are at Nouméa, New Caledonia.

The Commission consists of not more than twelve Commissioners, two from each Government. It normally holds one Session each year. There are two auxiliary bodies, the Research Council and the South Pacific Conference.

There is a Research Council meeting once a year. This may be either a meeting of the full Council, or of one or other of its three main sections, specializing in the fields of health, economic development and social development. Members of the Research Council are appointed by the Commission. They are selected for their special knowledge of the questions with which the Commission is concerned, and the problems of the territories in these fields. The chief function of the Research Council is to advise the Commission on what investigations are necessary. Arrangements to carry out those that are approved are the responsibility of the Secretary-General and other principal officers.

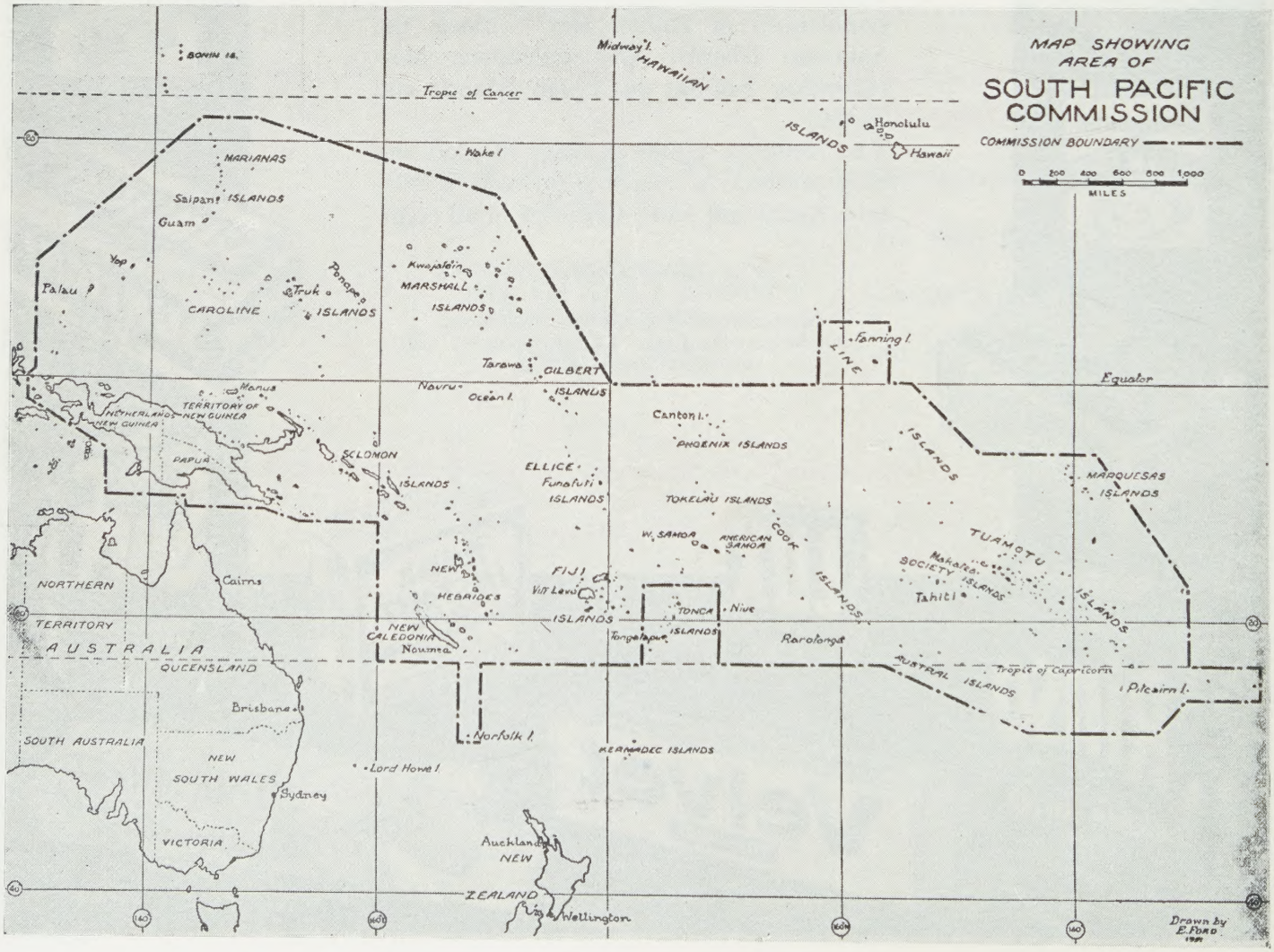
The South Pacific Conference, which meets at intervals not exceeding three years, consists of delegates from the local inhabitants of the territories, who may be accompanied by advisers. The first Conference was held in Fiji in April 1950, and was attended by delegates from fifteen territories and from the Kingdom of Tonga. The second Conference was held at Commission headquarters in April 1953. The third Conference was held in Fiji in April-May 1956, and the fourth Conference in New Britain in April-May 1959.

The principal officers of the Commission are: Secretary-General, Mr. T. R. Smith; Executive Officer for Health (Acting), Dr. T. C. Lonie; Executive Officer for Economic Development, Dr. A. H. J. Kroon; Executive Officer for Social Development, Dr. Richard Seddon. The powers and functions of the Deputy Chairman, Research Council, are exercised by the Secretary-General.

Further particulars of the Commission's activities may be obtained from the Secretary-General, Nouméa, New Caledonia.

FRONT COVER PHOTOGRAPH

On the closing night of the fourth South Pacific Conference held at Rabaul from April 29-May 13, delegates staged a memorable South Seas concert and variety show rich in talent and spontaneous gaiety. Here, a vocal trio presents a selection of islands songs—one, "Malaguna Beach", being composed specially for the occasion. Left to right: Miss Tiresa Hunter, Western Samoa; Mme. H. Jacquemin, French Polynesia; and Mrs. Teupokoina Morgan, Cook Islands. (See story on page 23.)



SPC QUARTERLY BULLETIN

VOL. 9. No. 3 JULY, 1959

CONTENTS

	Page
Rabaul Conference An Outstanding Success	18
A "Once-In-A-Lifetime" Concert. *By K. Vellacott-Jones*	23
Research Council Holds Tenth Meeting. *By A. H. J. Kroon*	25
Fisheries In American Samoa, Fiji And New Caledonia. *By H. van Pel*	26
Interim Report On Scolia Ruficornis In Fiji. *By Hubert W. Simmonds*	28
Fish Poisoning Reports Wanted For University Of Hawaii Study	31
The Fourth South Pacific Conference In Retrospect. *By C. E. Sayers*	32
Coconut Varieties In French Polynesia. *By R. Millaud*	35
A Travelling Library For The Solomons. *By W. A. Allison*	38
Nimboran—1959. *By P. J. van Dooren and R. H. Boyan*	40
Spearfishing In Pacific Waters. *By Rob Wright*	43
Educational Visit To Western Samoa And Fiji. *By C. W. Flavell*	47
Music Of New Guinea. *By Trevor A. Jones*	49
SPC To Hold Education Seminar For South Pacific. *By Richard Seddon*	50
Commission Appoints New Head For Economic Development Programme	51
The Cocoa Industry In Papua And New Guinea. *By V. D. Stace*	52
Beware Of Pesticide Poisoning. *By T. C. Lonie*	57
Copra Processing In Rural Industries. *By D. R. A. Eden*	59
A Junior Health Reader For The Islands	64
Need For Bamboos Tolerant Of Salinity. *By F. A. McClure*	66
"Pacific Reading"—Notes And News	67
Principal Commission Publications	71

EDITOR: *A. E. Read, B.Sc.*

THE SPC QUARTERLY BULLETIN, first published in January, 1951, features articles on selected activities in the Commission's three main fields of operation: economic development, health and social development. Articles are also contributed by specialists working in these and related fields, in the territories within the Commission area.

THE BULLETIN is given selective world distribution to people and institutions in widely differing fields sharing a common interest in the purposes and work of the Commission. It is published in two editions, English and French.

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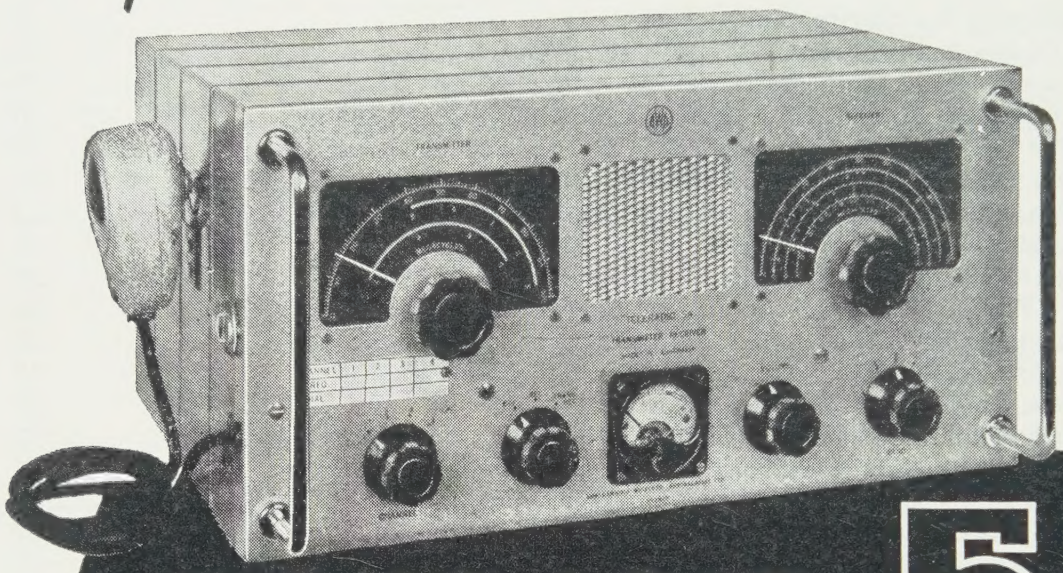

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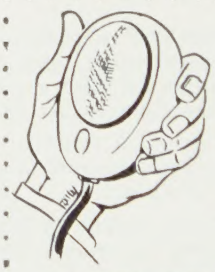

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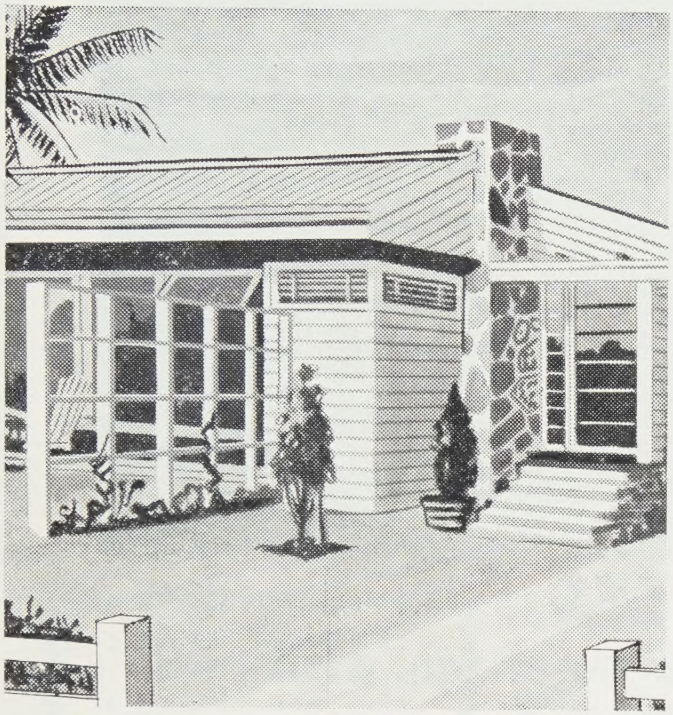

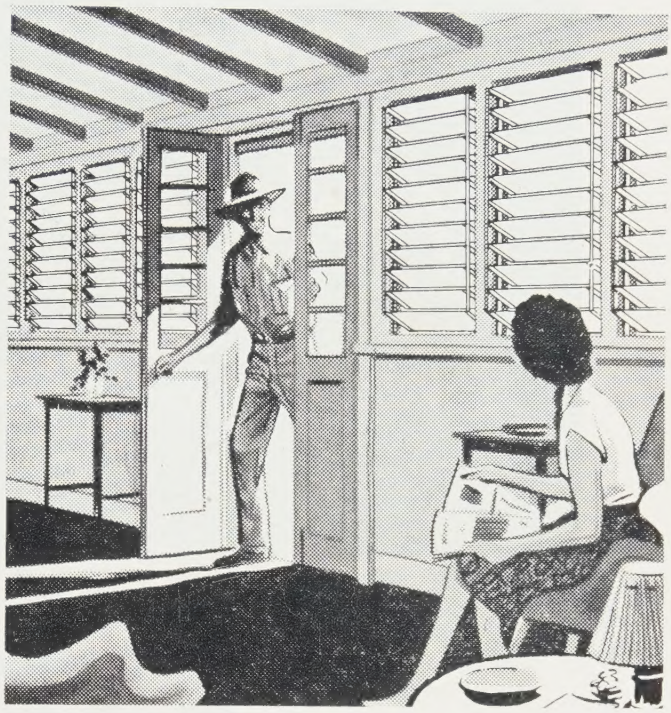

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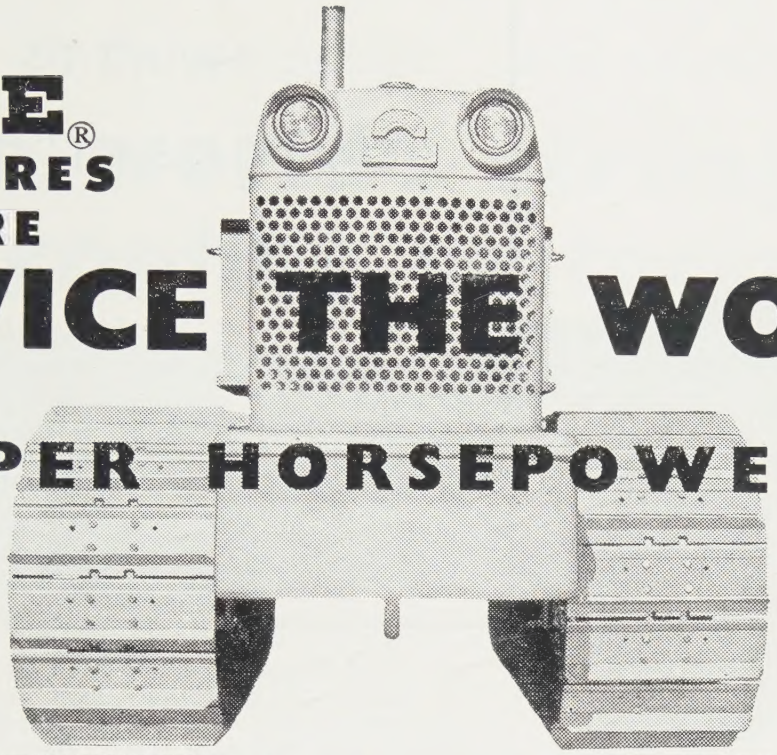

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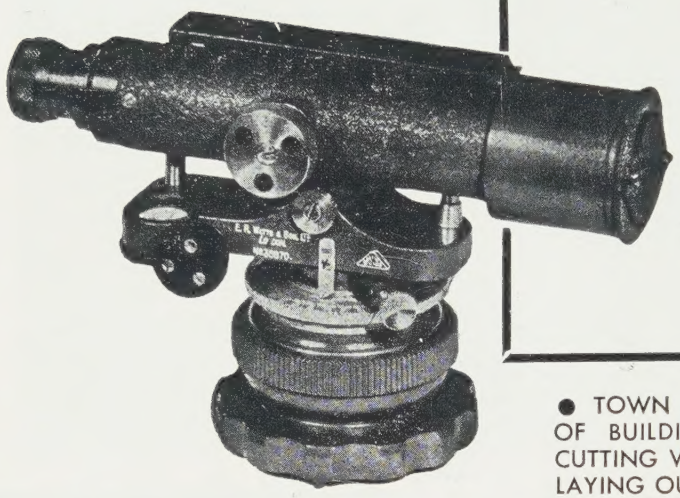

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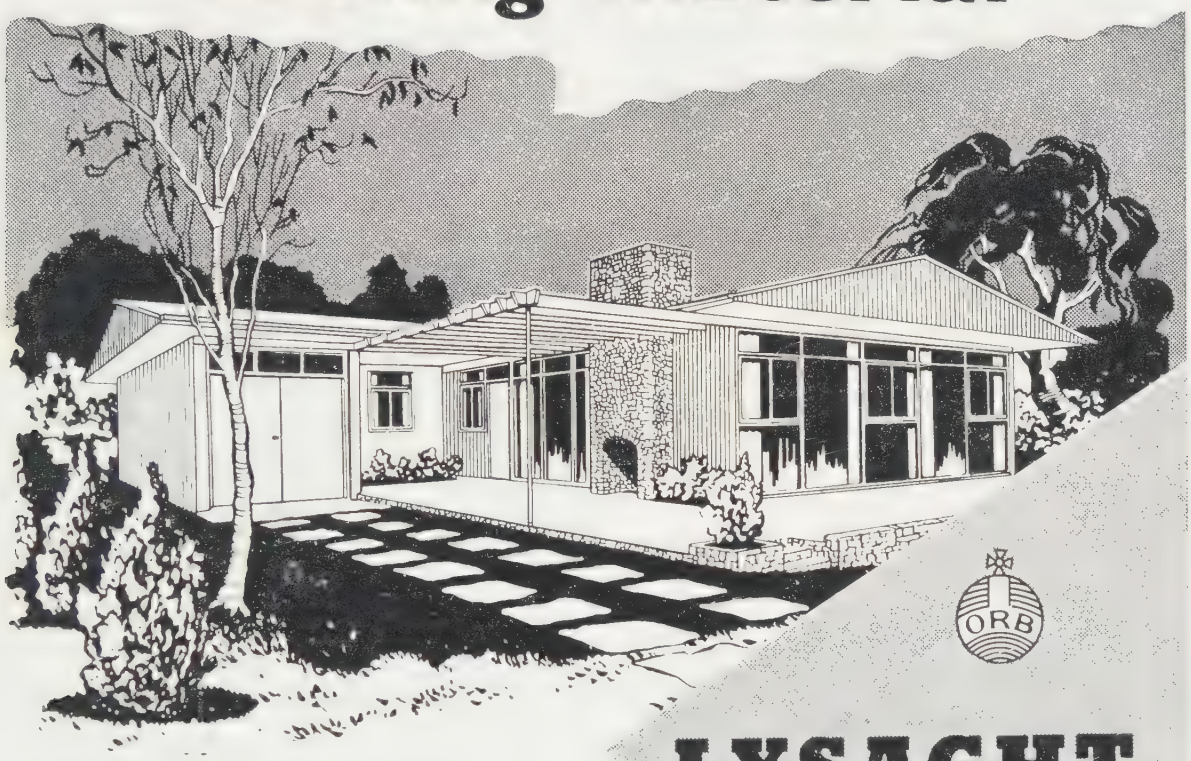

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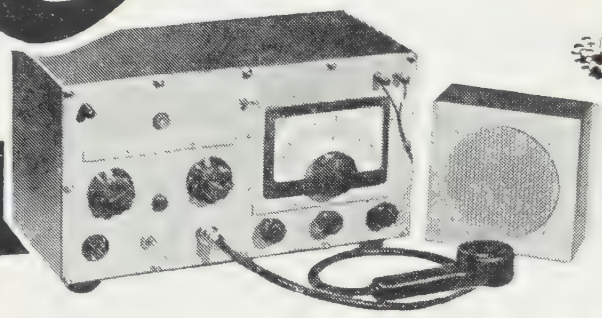

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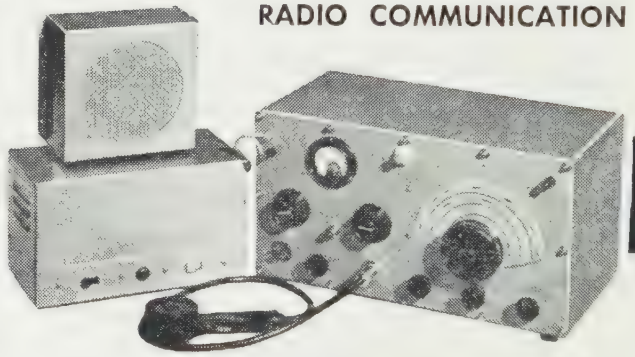

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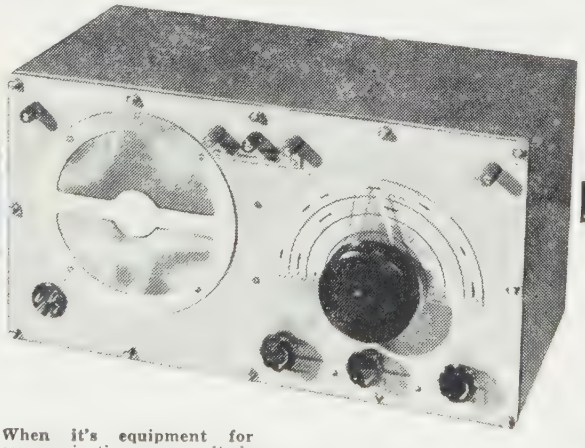

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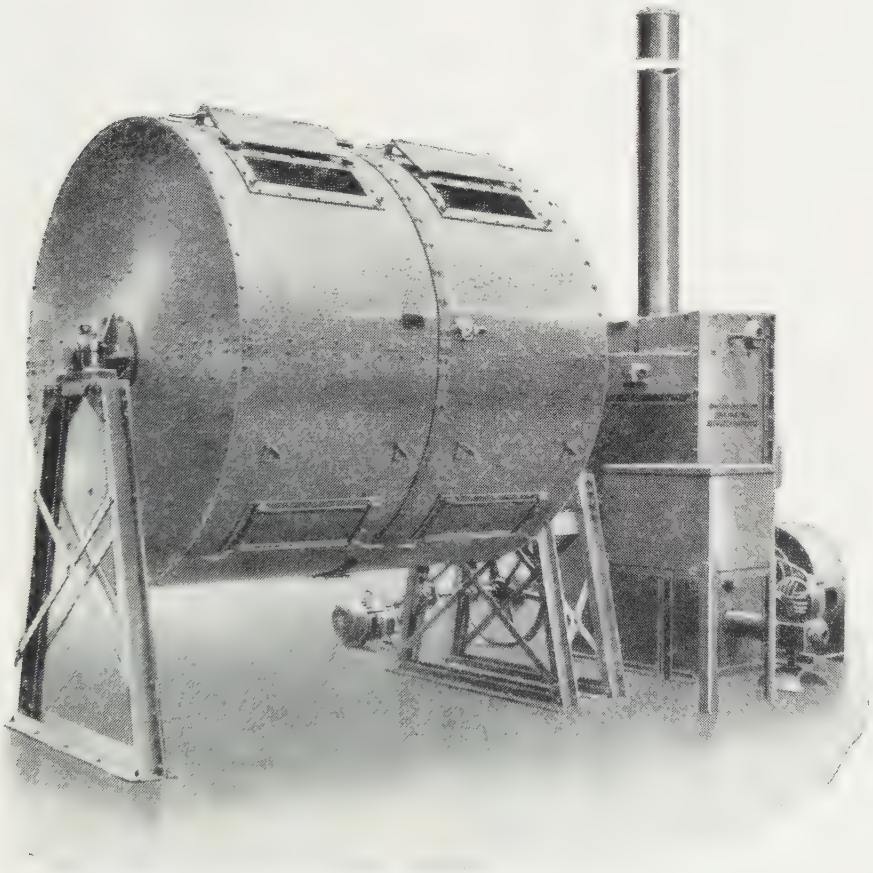

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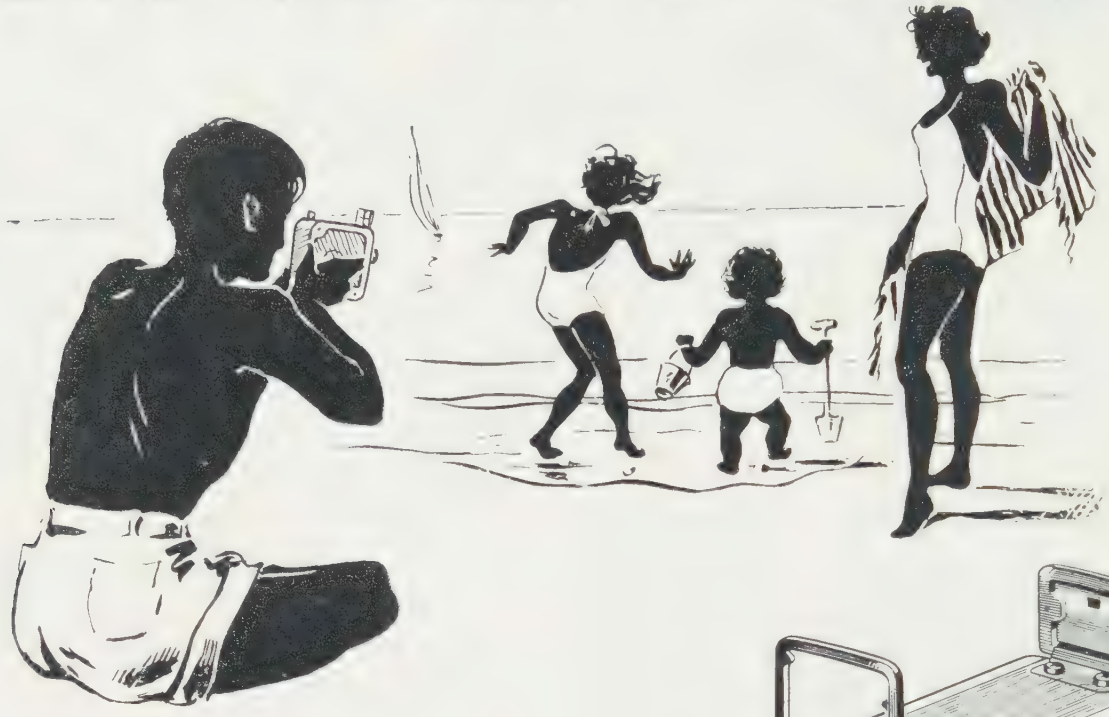

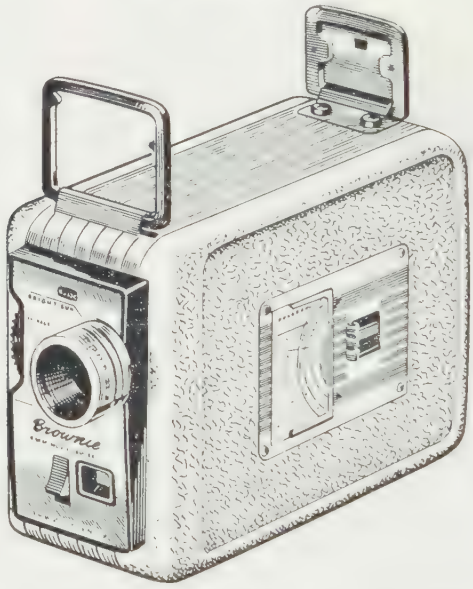

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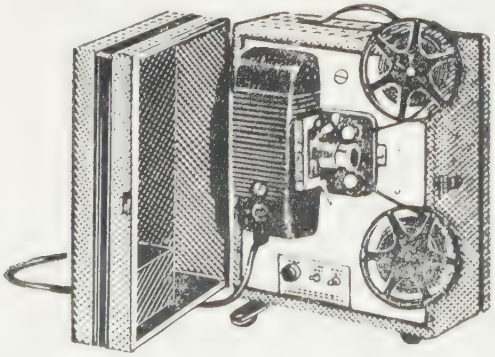

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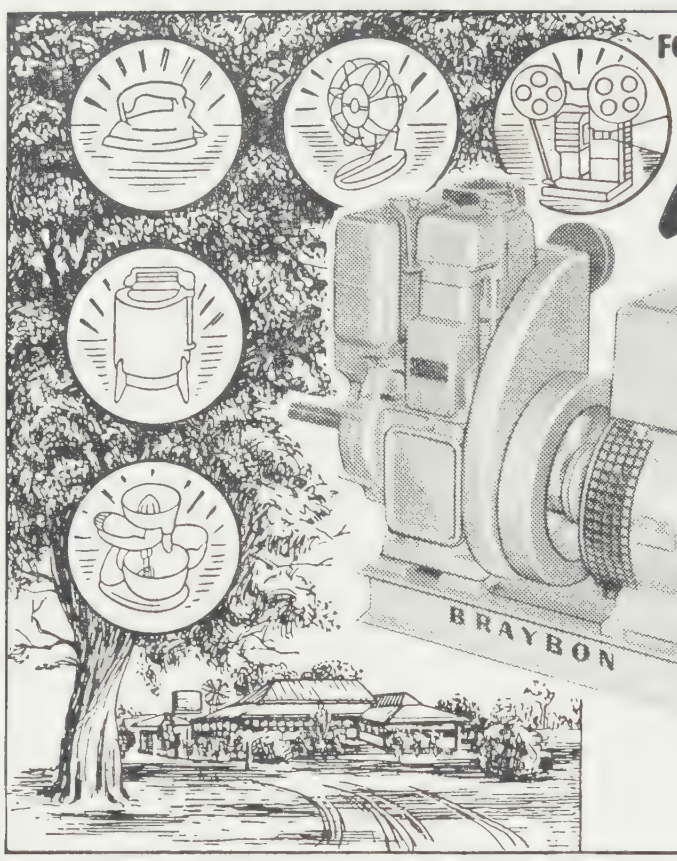

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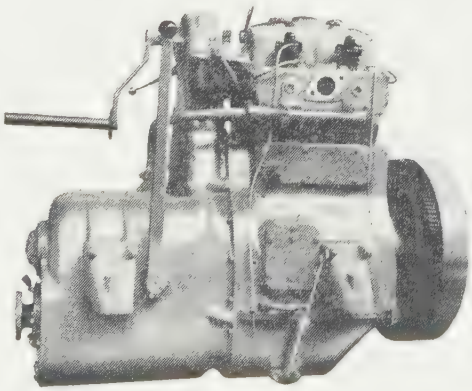

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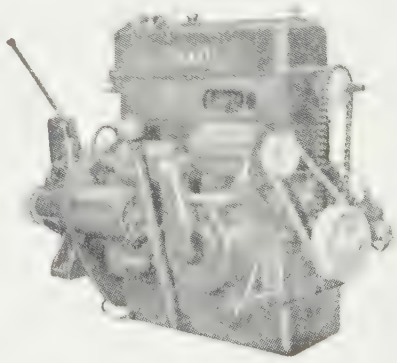

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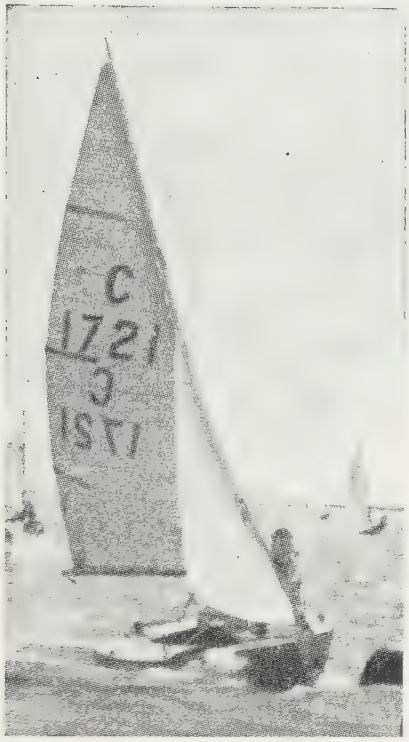

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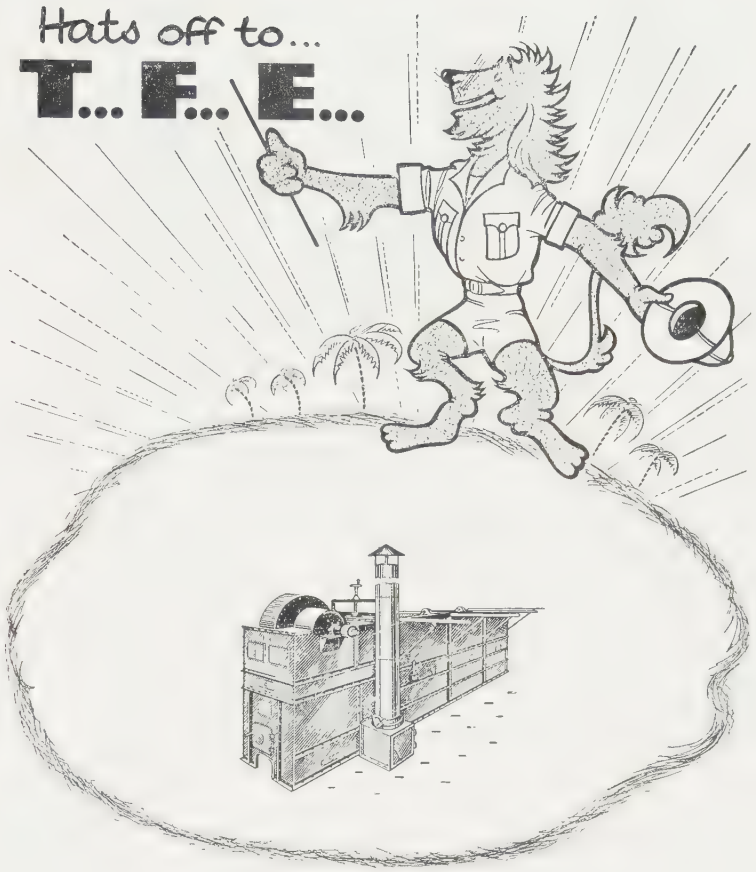

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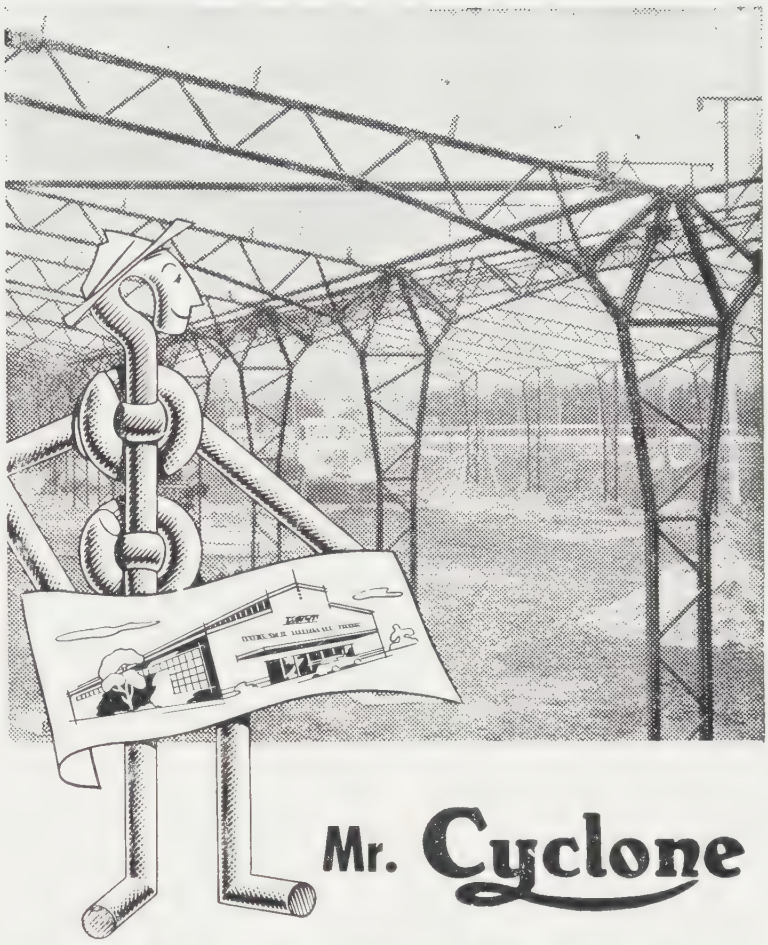

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Before he opened the Conference, His Honour the Administrator of Papua and New Guinea, Brigadier D. M. Cleland, received from the American Samoa delegation a traditional presentation of a kava root. A similar gift was also made to the Secretary-General of the South Pacific Commission, Mr. T. R. Smith. Talking Chief Saleapaga is shown here presenting a kava root to the Administrator.

Rabaul Conference An Outstanding Success

The fourth South Pacific Conference was held at Rabaul, New Britain, in the territory of Papua and New Guinea, from April 29-May 13. Sixty-five delegates and advisers attended from sixteen Pacific territories and the Kingdom of Tonga. The Conference was organized by the South Pacific Commission, of which it is an auxiliary body.

THE fourth South Pacific Conference was generally considered by all who attended it to have been the most successful yet held. Ideal conditions, colourful surroundings, the generous hospitality of the Administration and local residents, and, above all, the warm, friendly spirit that quickly developed among delegates and others attending, all combined to make it a most memorable gathering.

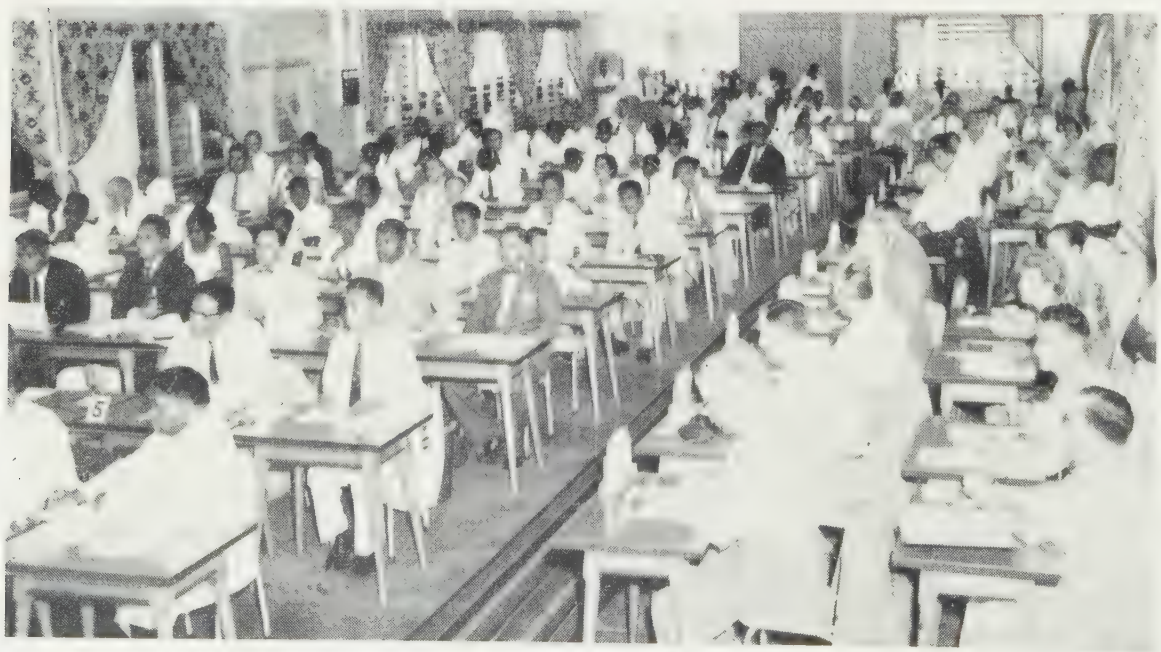
The sessions themselves were a continuing demonstration of the value of the Conference as a means of expression, of deliberation, and of request and recommendation to its sponsoring body, the South Pacific Commission.

The Conference was held at the Malaguna Technical Training Centre, an Administration school for training carpenters, plumbers, boat builders and other tradesmen.

Every facility was provided for the convenience and comfort of the visitors and the smooth functioning of the Conference programme. The school dormitories, specially partitioned into cubicles, provided excellent living quarters for delegates and others attending, while the sessions of the Conference were held in two large halls usually used as training workshops.

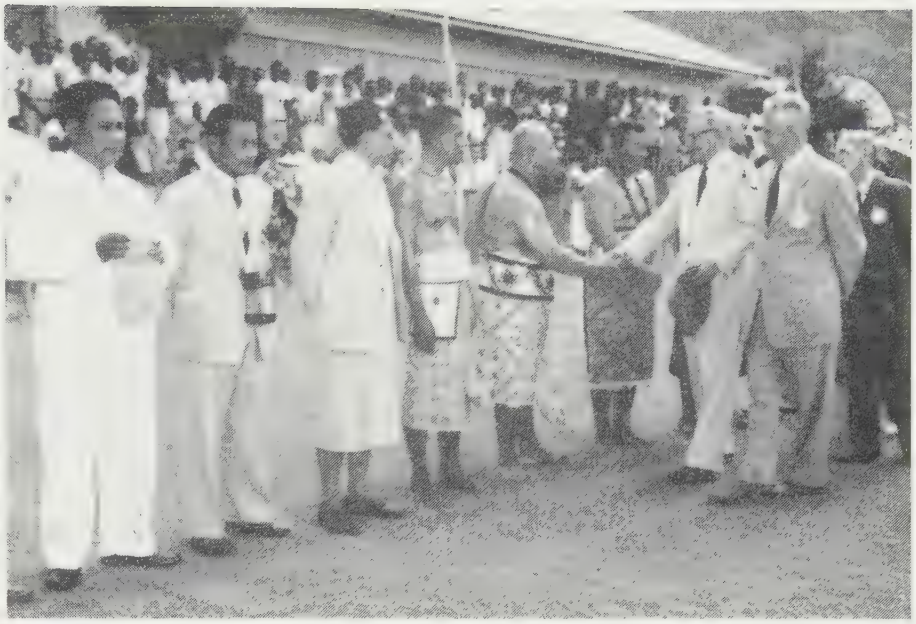
Two Committees Formed

For the second time the Conference



Delegates in the Conference hall listening to the opening address by Brigadier Cleland. On the right are observers (including members of South Pacific Commission delegations) and secretariat staff.

Right: Brigadier Cleland greeting delegates on the opening day. Here he is shaking hands with Chief Tuato'o from American Samoa. With the Administrator is Mr. T. R. Smith, Secretary-General of the South Pacific Commission, and (partly obscured) Mr. J. R. Halligan, Senior Commissioner for Australia on the South Pacific Commission, who was chairman of the Conference.



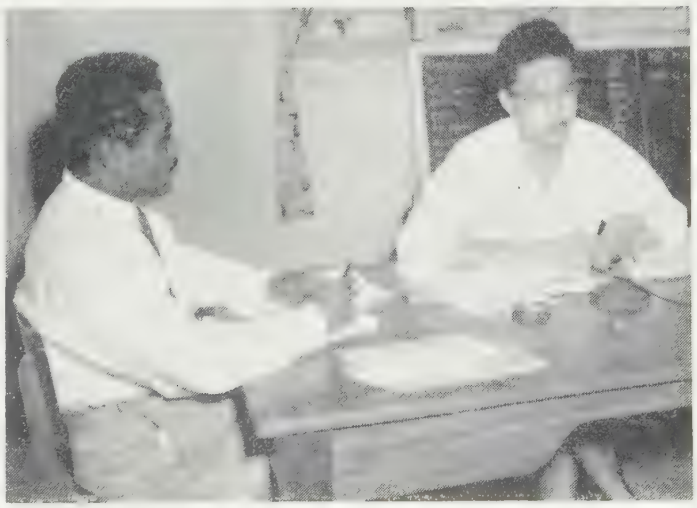
Right, centre: Six of the seven women delegates who attended the Conference. Left to right: Mrs. Lila Matelau (Papua and New Guinea), Miss Tiresa Hunter (Western Samoa), Mrs. Teupokoina Morgan (Cook Islands), Miss Nancy Gire (Papua and New Guinea), Miss Philo Gamauri (Papua and New Guinea), Makea Karika Takau Margaret Ariki (Cook Islands). The seventh woman delegate was Mme. H. Jacquemin from French Polynesia (she appears in the cover photograph, centre).

divided into two standing committees. One dealt with social and health questions, the other with matters affecting the economic welfare of the islands peoples.

And, again for the second time, the delegates themselves elected the chairman and vice-chairman of each committee. History was made when for the first time a woman was elected chairman of one of the committees. Miss Tiresa Hunter, of Western Samoa, was by ballot elected chairman of the social committee. (There were seven women delegates at the Conference, and all of them were members of the social committee).

The chairman of the economic committee was Mahe 'Uli'uli Tupouniua of Tonga. The vice-chairmen were Semesa Sikivou, Fiji (social development com-

Below: Miss Tiresa Hunter from Western Samoa, who was chairman of the social development committee, and the Hon. Semesa Sikivou from Fiji, who was vice-chairman. Below right: The chairman of the economic development committee was Mahe 'Uli'uli Tupouniua from Tonga (facing camera). With him is vice-chairman Raymond Gadabu, from Nauru.



mittee), and Raymond Gadabu, Nauru (economic development committee).

The Conference proceedings were governed by a general committee, on which each of the six governments forming the membership of the South Pacific Commission was represented by a member of a territorial delegation.

The Chairman of the Conference was Mr. J. R. Halligan, Australia's Senior Commissioner on the South Pacific Commission. He presided at the plenary sessions of the Conference and at meetings of the general committee. All other Conference proceedings were conducted by the delegates themselves.

Wide Range Of Topics Discussed

Introductory papers on a number of topics were presented and then discussed by delegates. The subjects included the problems resulting from the impact of participation in economic development with reference to land tenure and the growing of permanent crops, the extension of tourism, the role of custom and beliefs in relation to infant and maternal welfare, broadcasting, the place of recreation, including sport and youth activities, in the community, and the impact of the modern technical and industrial world on the life and culture of the islanders.[1]

It was noticeable that throughout the discussions on the agenda items and on

CONFERENCE ATTENDANCES

Chairman

Mr. J. R. HALLIGAN, Senior Commissioner for Australia to the South Pacific Commission.

Representatives from the South Pacific Territories

AMERICAN SAMOA

Delegates

HIGH CHIEF LEIATO.
HIGH CHIEF SOTOA.

Alternate Delegates

TALKING CHIEF TUATO'O.
TALKING CHIEF SALEAPAGA.

Interpreter

HIGH TALKING CHIEF MULITAU-AOPELE.

BRITISH SOLOMON ISLANDS PROTECTORATE

Delegates

Mr. SILAS SITAI, B.E.M.
Mr. SALANA G'AA, B.E.M.

Adviser

Mr. V. J. ANDERSEN, M.B.E.

COOK ISLANDS

Delegates

MAKEA KARIKA TAKAU MARGARET ARIKI.
Mrs. TEUPOKOINA MORGAN.

Alternate Delegate

Mr. TUAKEU PUNA.

Adviser:

Mr. L. K. PITT (also Adviser to Niue).

FIJI

Delegates

The Hon. H. B. GIBSON, O.B.E.
The Hon. SEMESA SIKIVOU.
The Hon. Dr. SAHU KHAN.

FRENCH POLYNESIA

Delegates

Mrs. H. JACQUEMIN.
Mr. E. LE CAILL.

GILBERT AND ELLICE ISLANDS

Delegates

TE TABUNAWATI TAKOA.
TE REUBEN K. UATIOA.
HENRY FAATI NAISALI.
IUPASI KAISALA.

Adviser

Mr. G. BRISTOW.

GUAM

Delegates

Mr. RICHARD TAITANO.
Mr. VICENTE BAMBA.

NAURU

Delegate

HEAD CHIEF HAMMER DE ROBURT.

Alternate Delegate

Councillor RAYMOND GADABU.

Adviser

Mr. G. A. PITTMAN.

NETHERLANDS NEW GUINEA

Delegates

Mr. MARCUS KAISIEPO.
Mr. TOON MESET.

Alternate Delegates

Mr. ELIEZER WETTEBOSSY.
Mr. TOBIAS MBEARME GEBZE.
Mr. DICK SARWON.

Adviser

Mr. PIETER MERKELIJN.

Interpreter-Translator

Mr. C. H. STEFELS.

NEW CALEDONIA AND DEPENDENCIES

Delegates

Mr. PIERRE ISAMATRO.
Mr. PIERRE KETIWAN.

NEW HEBRIDES (CONDOMINIUM)

Delegates

Mr. JOHN KALSAKAU.
CHIEF THOMPSON TANGARASI.

Advisers

Mr. RICHARD ANGELONI, O.B.E.
Mr. J. HERRY (Adviser to all French delegates).

NIUE

Delegate

Mr. LESLIE REX.

PAPUA AND NEW GUINEA

Delegates

Mr. KAI KAI IVASI.
Miss NANCY GIRE.
Mr. RAYMON.
Mr. G. A. KASSI.

Alternate Delegates

Mr. SINAKA GOAVA.
Mr. TOVIN TOBAINING.
Mr. KONDON-AKAU'UNDO.
Miss PHILO GAMAURI.

Advisers

Mr. J. K. McCARTHY, M.B.E.
Mr. ELLIOTT-ELIJAH, M.B.E.
Mrs. LILA MATELAU.
Mr. REUBEN TAUREKA.

KINGDOM OF TONGA

Delegate

H.R.H. PRINCE FATAFEHI TU'IPELEHAKE.
MAHE 'ULI 'ULI TUPOUNIUA.

TRUST TERRITORY OF THE PACIFIC ISLANDS

Delegates

Mr. NAPOLEON D. FANG.
Mr. KASIANO F. JOSEPH.
Mr. OLYMPIO T. BORJA.

Alternate Delegate

Mr. ELIAS P. SABLAN.

Advisers

Mr. FRANK J. MAHONY.
Miss MYRTLE HOLMSTAD.

WALLIS AND FUTUNA ISLANDS

Delegates

Rev. Father VITTOLIO.
Mr. SOSEFO MAKAPE (DIT PAPILIO).

WESTERN SAMOA

Delegates

Miss TIRESA HUNTER, B.A.
Mr. I. SOSENE-FEAGAI.

Observers from Official and Non-official Institutions

Commission on Overseas Missions and Inter-Church Aid of the National Missionary Council of New Zealand: Rev. G. G. CARTER.

The Australian National University: Professor J. A. BARNES.

The Apostolic Delegation, Australia: Very Reverend JAMES DWYER.

Bernice P. Bishop Museum and Pacific Science Board: Mr. H. COOLIDGE.

Pacific Science Association: Dean KNOWLES A. RYERSON.

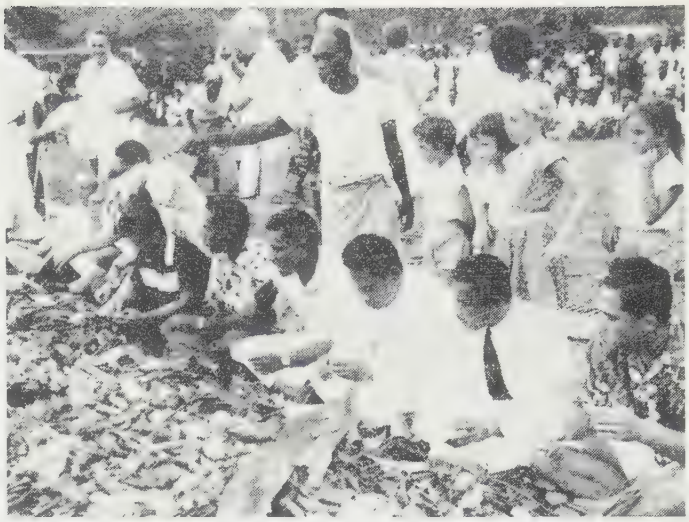
National Missionary Council of Australia: Dr. A. CAPELL.

Tri-Institutional Pacific Program: Dr. W. DAVENPORT.

World Health Organization: Dr. STEPHEN FALKLAND.

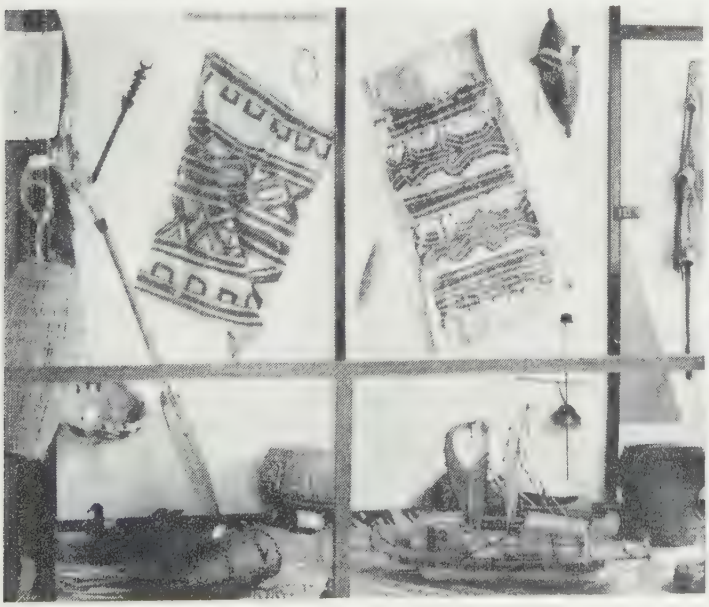
Other Attendances

Commissioners of the South Pacific Commission, alternates and advisers nominated by member Governments were present as observers. The Secretary-General and other principal officers of the South Pacific Commission also attended.



These photographs were taken during the traditional feast and "sing-sing" arranged for delegates at Queen Elizabeth Park, Rabaul, on May 2. The hosts were five native local government councils. The Methodist Mission at Gaulim also entertained Conference visitors at a feast following a mock battle and a wife-buying ceremony. In the evening a fire dance was performed.

During a visit to Vunapope Catholic Mission delegates were shown over the modern printing shop. Right: Inspecting the plant nursery at Keravat agriculture experiment station.



An impressive South Seas arts and crafts exhibition was specially assembled for the Conference, contributions being sent from many parts of the Pacific. Shown here are exhibits from Papua and New Guinea (left) and New Caledonia

" . . . Soon I will die, and pidgin will die with me . . ."

Something of the meaning and purpose of the Conference and of its sponsoring body, the South Pacific Commission, was contained in the simple and moving farewell speech delivered at the closing meeting by Kondon-Akau'undo, a member of the Papua and New Guinea delegation. Speaking emotionally in pidgin English through an interpreter, Kondon, who was *Luluai* (headman) of the Naruga clan of Chimbu people for twenty years, said:

Kondon-Akau'undo

"I am from Kundiawa in the Chimbu. There are many people in Chimbu—as the white man calls the number, half a million. When I came here I did not know there were people living in the Pacific, such as Fiji, Samoa and all the other places, for it is only twenty-five years ago since my country, the highlands, was found by the white man.

"At that time we were living as primitive people and fighting one another. We had very little of the good things of life—poor houses, no roads and sometimes very short of food.

"That is only twenty-five years ago. Now we are on the way to civilization with medical services provided and schools, until my people are greatly improved, although there are yet very few white men or civilization amongst the Kainantu, the Goroka and other places in the highlands. We have a local council and we pay taxes to it and the council helps us.

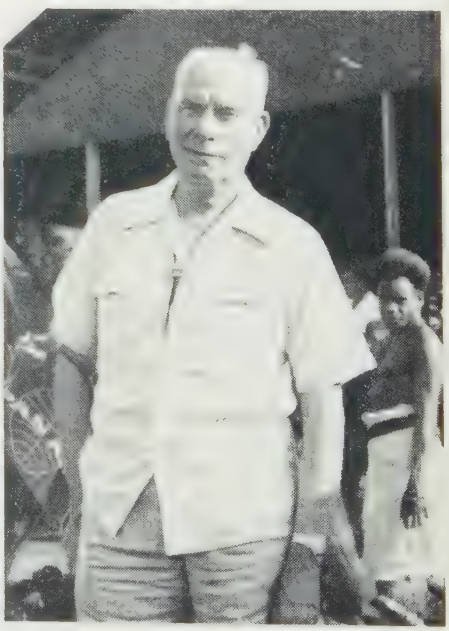
"Perhaps you will laugh at me because I speak pidgin and I cannot read or write, but soon I will die and pidgin will die with me, and my children will be able to speak English and so understand you all.

"I thank you for coming to Rabaul, Mr. Chairman and the many friends I have made at this Conference. I wish you a happy return to your countries and may we see each other again."

the work of the Commission, there was an underlying feeling that in whatever was attempted for the economic and social welfare of the islanders, education was an essential factor.

The Administrator of Papua and New Guinea had suggested this in his address at the official opening of the Conference. "Orderly social change," he said, "is governed by the pace set by the educational advancement of the people,

(Continued on page 58)



Delegates who visited the Rabaul market were impressed by the variety and quality of the vegetables and fruit on sale. Right: Dean Knowles A. Ryerson, Senior Commissioner for the United States on the South Pacific Commission, was also an interested visitor to the market. (Dean Ryerson was chairman of the Commission's session held immediately following the Conference to consider its recommendations.)

A "Once-In-A-Lifetime" Concert

The closing of the fourth South Pacific Conference on May 13 was followed in the evening by a memorable South Seas concert and variety show, staged by delegates and others.

By K. VELLACOTT-JONES*

With a speed and dexterity that held his audience spell-bound, High Chief Leiato performed his knife dance to a rhythmic accompaniment of chanting and clapping by his fellow-Samoans.

THE people who had the good fortune to attend the concert put on by the delegates to the fourth South Pacific Conference at Rabaul on May 13 thoroughly enjoyed an experience of a kind that comes to many only once in a lifetime. For on this occasion the delegates packed into a single evening a fascinating selection of all the talent of the South Seas—the songs and dances of Samoa, New Caledonia, Fiji, Tonga, the Gilbert, Ellice and Wallis Islands, French Polynesia, the Cook Islands, New Guinea, Guam and the other Micronesian Islands.

It was a great night for everybody, artists and audience alike, and right from start to finish it had the rare charm and spontaneous joyousness characteristic of the island peoples of the South Pacific.

High Chief Leiato of American Samoa held the audience spellbound with his famous knife dance, twirling the wicked-looking steel blade with such skill that it seemed to have a life of its own, and that his hands merely followed its flashing path. Not for a second during the fifteen-minute act did the knife move slowly enough for anyone to accurately gauge its length, but its blade was easily two feet long, with a vicious-looking hook at the tip. At times he had it spinning over and under his fingers, then would suddenly whirl it behind his back, between his legs, up over his shoulders, while occasionally he would send it lunging spectacularly towards the front row of the audience, but had it back in orbit before the astonished "targets" could blink an eyelash.

And all this time Leiato's fellow American Samoans, in colourful siapo garb (tapa cloth), danced, stamped, clapped and chanted an accompaniment to the performance. Their full-throated Samoan shouts echoed through the impromptu concert hall as their leader sent the knife whirling faster and faster, and thunderous applause from the audience hit the walls and roof of the building when the act was finished.

To let the audience get its breath back Miss Tiresa Hunter (Western Samoa), Mrs. Teupokoina Morgan (Cook Islands) and Madame Hitiura Jacquemin (French Polynesia) changed the tempo of the concert with the captivating songs and dances which for a million wishful dreamers the world over spell coral sands, rustling palms and the laughter of a people born with the gift of joyous living.

Delegates from the Gilbert, Ellice and Nauru Islands took the stage with a magnificent contribution in which one

An action song by Cook Islands delegates Makea Karika Takau Margaret Ariki (facing camera) and Mrs. Teupokoina Morgan.

* Miss Vellacott-Jones is Public Relations Officer, Territory of Papua and New Guinea.

Performers as well as audience thoroughly enjoyed this traditional finale to a Samoan presentation, performed by Miss Tiresa Hunter and her fellow-delegates.

man danced and the others sat in a circle, literally "dancing" as they sat, while supplying a rhythmic musical background in vital, vibrant partnership with the brilliant solo dancer, Henry Faati Naisali of the Gilbert and Ellice Islands.

For connoisseurs of dancing this one act alone was worth a trip across the Pacific, and the memory of it for many of the audience will be a classic of poetry of motion and superb expression of high spirits.

The wheel of time was turned back to the Stone Age by delegates from the island of New Guinea, who showed in more sombre dances how their people through chants and dances passed their traditions and culture from one generation to another.

Then, in contrast, there was a modern touch with a sketch which had a special appeal for the Conference section of the audience. This was a clever skit on the proceedings of the Conference in which an adviser-interpreter (Pieter Merkelijn of Netherlands New Guinea) adroitly burlesqued his role over the previous two weeks by appearing with his head festooned with earphones and frantically gabbling first one language and then another into his handful of microphones.

A "serious-minded" French Polynesian delegate with memories of studying this and that proposed a new subject for discussion—the effect of moonlight on the life of the South Pacific people.

And since there is no song about Rabaul—at least none known to the visitors—the delegates sang one of their own composition, extolling the "fragrance of sulphur drifting over Malaguna beach from Matupi volcano", and what with the South Seas gift for turning even words into a song, "Matupi" sounded more like a musical description of a romantic lagoon than a grim, heat-scarred, crater-pitted volcano.

To finish off the evening the boys of Malaguna Technical Training Centre wound up the programme with a dance of the story-telling variety, and they and the audience enjoyed it so much that once started it was hard to stop until urgent stage whispers from behind the plyboard "curtain" reminded them that the hour was late and that all good things must come to an end.

An Expression Of Conference Friendships

But there was much more to the concert than just a highly enjoyable evening. It was in fact an outward and visible sign of the friendships made during the Conference, the cementing of what perhaps had hitherto been unrealized and unrecognized ties of common interest and the eager acknowledgment of the kinship links between the widely-scattered peoples of the South Pacific.

Meeting first at the opening of the Conference as strangers, the delegates were quickly at home with one another, and in the committee rooms as well as during their leisure hours the most single striking feature of this gathering of South Pacific peoples was the similarity of their culture, their problems and their individual aims for each territory.

No observer at the Conference could have failed to notice the remarkable unity of thought and aims among the various delegations on the broad issues now confronting the island peoples.

Each group, for instance, soon disclosed the concern felt for the future of its individual culture under the impact of increasing contact with the outside world.

There was a common recognition and anxiety on the score of rapidly-rising population matched against limited natural resources.

And searching for means of increasing island revenues, practically all the delegations looked to developing a big tourist trade to capitalize on the hitherto unused assets of scenery, climate, customs and culture. But every delegation shared in common one keen anxiety on this score, that over-commercialization be prevented to avoid any debasement of all that in South Seas life means so much to them.

In this day of international friction not all conferences are successful, and admittedly the South Pacific Conference neither could nor did solve any of the problems listed in its agenda. But it *did* widen the outlook of delegates on these matters, give them the stimulus of open discussion on a Pacific rather than an island basis, and build up a common pool of knowledge among the delegates upon which to draw in meeting the individual problems of their territories.

In the formal language of international agreements, the objectives of the South Pacific Commission are to encourage and strengthen international co-operation in promoting the economic and social advancement of the peoples of the South Pacific region. In much less formal language the delegates seriously and effectively pursued that aim in their two weeks of debate and discussion at Rabaul.

And then, when it was time to close down, they bade goodbye to formality in true South Sea island style and showed the measure of their friendship, their comradeship and happy co-operation in one of the best and most enjoyable entertainments ever staged anywhere in the Southern Hemisphere.

Fiji Cocoa Plantings To Be Extended

Following the successful harvesting last year of Fiji's first commercial cocoa crop, planting of cocoa is to be extended to new areas of the Colony.

The Department of Agriculture gives farmers up to 600 cocoa seedlings free of charge, and in some cases provides an additional free issue for adult sons of farmers. It also advises farmers on the selection and preparation of land, care of the plantation, and on the fermentation, drying and marketing of the cocoa beans.

Participants and observers who attended the tenth meeting of the Commission's expert advisory body, the Research Council, photographed outside Commission headquarters in Noumea. Front row (l. to r.): Mr. B. E. V. Parham, Mr. J. Spivey, Mr. T. R. Smith (Secretary-General), Mr. F. C. Henderson (Chairman), Dr. S. C. Harland, Dr. H. Belshaw, Dr. F. Bugnicourt. Back row (l. to r.): Mr. C. H. Allan, Mr. R. W. Parkinson, Dr. Richard Seddon, Mr. J. Ham, Mr. J. M. Watson, Mr. R. Millaud, Dr. A. H. J. Kroon, Dr. T. C. Lonie. Dr. Harland and Dr. Belshaw attended the meeting as specialist consultants (with full membership status).

Research Council Holds Tenth Meeting

By A. H. J. KROON*

THE tenth meeting of the South Pacific Commission's expert advisory body, the Research Council, was held at Commission headquarters at Nouméa from June 20 to July 1. The Chairman was Mr. F. C. Henderson, Chief of the Division of Plant Industry, Department of Agriculture, Stock and Fisheries, in the Territory of Papua and New Guinea. Mr. Henderson was also observer for the Food and Agriculture Organization of the United Nations.

The meeting was attended by the economic development members of the Council only, and the economic development programme was the principal subject for consideration. Special attention was given to the coconut industry, and to the economic aspects of agricultural and non-agricultural problems in relation to the overall economy of the South Pacific region.

The Council benefited greatly from the presence of two specialist consultants, Dr. S. C. Harland, Professor Emeritus of the University of Manchester, and Dr. H. Belshaw, until recently Macarthy Professor of Economics in the Victoria University of Wellington, New Zealand.

The Council also had the benefit of the advice of Mr. C. H. Allan, Assistant British Resident Commissioner, New Hebrides, Monsieur R. Millaud, Director of the Agriculture and Forestry Services of French Polynesia, and Mr. R. W. Parkinson, Commerce and Industries Officer, Fiji, all of whom attended the meeting as advisers.

Programme Re-Cast

The Council reviewed and re-cast the economic development programme and suggested reforms in the approach to, and the methods of, handling the Commission's programmes. In this context

(Continued on page 66)

* Executive Officer for Economic Development, South Pacific Commission.

TENTH RESEARCH COUNCIL MEETING: Participants and Observers

Members

Dr. F. BUGNICOURT: Director, French Institute of Oceania, Noumea.

Mr. J. HAM: Head of Agricultural Extension Service and Education Branch, Department of Economic Affairs, Hollandia, Netherlands New Guinea.

Mr. F. C. HENDERSON: Chief, Division of Plant Industry, Department of Agriculture, Stock & Fisheries, Port Moresby, Territory of Papua and New Guinea.

Dr. A. H. J. KROON: Executive Officer for Economic Development, South Pacific Commission, Noumea.

Dr. T. C. LONIE: Acting Executive Officer for Health, South Pacific Commission, Noumea.

Mr. B. E. V. PARHAM: Director of Agriculture, Apia, Western Samoa.

Dr. R. SEDDON: Executive Officer for Social Development, South Pacific Commission, Noumea.

Mr. T. R. SMITH: Secretary-General, South Pacific Commission, Noumea.

Mr. J. SPIVEY: Contract and Program Officer, Trust Territory of the Pacific Islands, Agana, Guam.

Mr. J. M. WATSON: Director of Agriculture Suva, Fiji.

Specialist Consultants (with full membership status)

Dr. H. BELSHAW, M.A., Ph.D.: Professor of Economics (formerly of Victoria University, Wellington, New Zealand).

Dr. S. C. HARLAND, D.Sc., F.R.S.: Emeritus Professor, Manchester University, Manchester, England.

Advisers

Mr. C. H. ALLAN: Assistant British Resident Commissioner, Port Vila, New Hebrides.

Mr. R. MILLAUD: Director, Agriculture and Forestry Service of the Territory of French Polynesia, Papeete, Tahiti.

Mr. R. W. PARKINSON: Commerce and Industries Officer, Government of Fiji, Suva, Fiji.

Observer

Mr. F. C. HENDERSON: Observer for the Food and Agriculture Organization of the United Nations, Rome, Italy.

SOME NOTES ON . . . . . .

Fisheries In American Samoa, Fiji And New Caledonia

In this article the Commission's fisheries officer briefly reports on recent investigations in the above territories.

By H. VAN PEL

Mr. Charles Ostrander, Extension Agent Supervisor in American Samoa, watches the release in a brackish swamp on Aunu'u Island of a batch of tilapia from Western Samoa. This was early in 1957. The introduction was successful, and today tilapia are taken there regularly.

American Samoa

THE foremost industry in this territory is fish canning. This activity started in 1954 when the Van Camp Sea Food Company re-opened a canning factory previously closed due to insufficient supplies of fish.

Exports of canned fish and by-products have steadily increased since 1954. The plant employs approximately 400 Samoans of both sexes. This industry is a boon for the population, for not only does it provide the people with a steady income, but also with a supply of cheap, fresh fish.

While canned tuna constitutes the main return for the cannery, marlin, wahoo and other fish caught together with the tuna are sold locally, either in canned form or frozen, at 10 cents a pound. Some frozen fish is also exported to Western Samoa.

The cannery also exports fishmeal to the United States. During the fiscal year ended June 30, 1958, the total value of canned fish and by-products exported was U.S. $5,671,981.

The plant is supplied by some 40 longliners, two of which are Korean boats, the rest being Japanese. Some Samoan fishermen are trained on these boats. Another training scheme operates a launch. There are hopes that a fisheries training vessel will soon be available.

Attention was given recently to the possibility of introducing the commercially-valuable *Trochus niloticus* into American Samoa. The reefs have been investigated, and with few exceptions, have been found suitable for the establishment of trochus.

Tilapia mossambica were brought

Above: Japanese and Korean tuna longliners moored in Pago Pago harbour, near the cannery. Right: The steel longliner on the right, moored opposite the cannery, is used as a service ship. She also has a refrigerated hold which is used as a temporary store for frozen fish.

When in Fiji Mr. Louis Devambez, the Commission's assistant fisheries officer, caught the kuklia shown above during his survey of rivers, one of which was the Navua (shown at right).

some time ago from Western Samoa to the island of Aunu'u, where they were released in a brackish swamp. This introduction was quite successful and the fish are now caught at night with lights, and consumed locally.

Eighty *Tilapia* were recently taken from Aunu'u to be released in the Leone Creek on Tutuila. None was lost in transport. Once they have become well established, they will be used for food and for bait.

Fiji

The Commission's assistant fisheries officer, Mr. Louis Devambez, made some preliminary investigations in February in various rivers of Viti Levu to prepare the way for stocking them with game fish. Final investigations have not been completed.

The first fish to be released in Fijian waters were *Ophicephalus striatus* from the Commission ponds at Port Laguerre, New Caledonia. These fish were about 17 months old, 8″ to 10″ long. They should start spawning shortly. One 10″ female damaged accidentally was dissected and was estimated to contain over 2,600 eggs.

Two other species of game fish are being investigated for eventual introduction in the area, and may be used later on for stocking other rivers in Fiji.

Mr. Devambez visited the island of Ovalau to determine the possibility of establishing a tuna fishing industry. He found that facilities for harbour and shore installations were adequate.

New Caledonia

A new fish has been introduced in the Commission ponds at Port Laguerre, New Caledonia. This is *Tilapia zilli*, of which 45 fingerlings were recently received from Honolulu.

These fish have several advantages over *Tilapia mossambica*. They grow bigger, are less prolific, and eat coarser foods. They will be kept in the ponds under observation for some time.

In March, 1957, and August, 1958, *Tilapia mossambica* were released in small numbers in two swamps in the vicinity of Yaté, in the southern part of New Caledonia.

Upon completion of the new Yaté hydro-electric project, an artificial lake was formed about thirteen miles long and three miles wide, with an area of close on one million acres.

Although they were originally some 130 feet above the normal level of the river, the two swamps stocked with *Tilapia* in 1957 and 1958 have become part of this lake. The *Tilapia* are now present in millions, and anglers are catching them with pole and line, using earthworms for bait. A bag of a few hundred *Tilapia* for two or three hours of fishing is not uncommon. According to these anglers, the fish are quite tasty.

The sight of schools of *Tilapia* swimming unconcernedly among the submerged trees and bushes at the edge of the lake is quite new for New Caledonia.

Experimental fishponds at Sigatoka Agriculture Station, Fiji.

General view of the breeding site at Dravo, showing box containing the compost in which the parasites are bred. The wire cover is placed over it later to prevent the escape of unparasitised beetles.

INTERIM REPORT ON *Scolia Ruficornis* In Fiji

In May 1958 a colony of Scolia ruficornis *cocoons was brought to Fiji from the Palau Islands in the hope that eventually this larval parasite will provide an effective control for the rhinoceros beetle, now firmly established in Viti Levu.*

By HUBERT W. SIMMONDS*

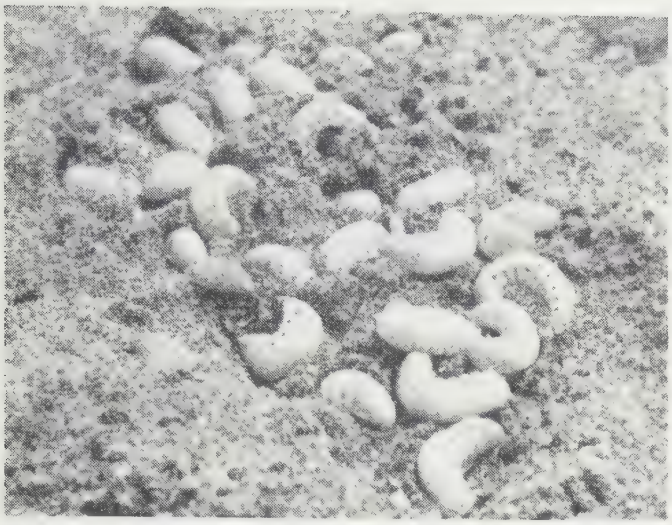
SOON after the discovery that the Asiatic rhinoceros beetle, *Oryctes rhinoceros* L., had reached Western Samoa, the German Administration of that day engaged Dr. Karl Friederichs to proceed on a world tour with the objective of obtaining natural enemies of the pest. After an unsuccessful search in Southern Asia this officer went on to Madagascar, where he hoped to obtain *Scolia oryctophaga,* a wasp known to attack certain species of the genus in that country. Unfortunately he was caught up in the 1914-18 war, and was, I understand, interned.

In 1933 I was seconded to Samoa to make a report on the position there. Arising out of that report I was, after my retirement from the Fijian service, asked in 1938 to proceed to Malaya and try to ascertain whether any useful controlling agency occurred there, and if unsuccessful to go on to Mauritius and Madagascar and endeavour to obtain colonies of *S. oryctophaga* for shipment to Samoa.

Meanwhile we had learnt that the Dutch in Java had obtained a colony of this parasite, and were said to be breeding it in captivity upon *O. rhinoceros*; also that in Malaya, Corbett had recorded another species of Scolia, as a true parasite of the Asiatic beetle. Unfortunately, however, the Dutch had been unable to get the emergences of *oryctophaga* to synchronize for mating purposes, and their colony had died out. (I came to the conclusion, based upon Mauritian records, that their difficulty arose from the absence of any cool season in Java, a difficulty that we also would come up against should we succeed in transporting it the long distance

*Formerly Government Entomologist, Fiji.

Two views of the sifting of the compost to collect the cocoons of parasites which may have bred in the boxes. Author at extreme right.



Left: Thirty third-instar rhinoceros beetle grubs were placed on compost in one of the boxes for parasitisation. This photograph shows that some have already burrowed down into the compost, where the parasite will later follow and attack them.

to Samoa). Meanwhile, tests which I made failed to confirm Corbett's record, nor did dissection of adult beetles in Malaya disclose the presence of any internal parasite. (I cannot here stress too definitely that no true specialized parasite of this beetle has ever been found in Asia, despite the number of entomologists who have worked upon it. Predators certainly occur, but many of these are species which it would be very unwise to introduce into another country).

I spent three months searching in Malaya and another month in Java, where the only possible predator or parasite discovered was a carabid beetle, *Catascopus facialis* Weid., a colony of which was sent to Samoa, where, although it seems to have arrived in good condition, it has not been seen since.

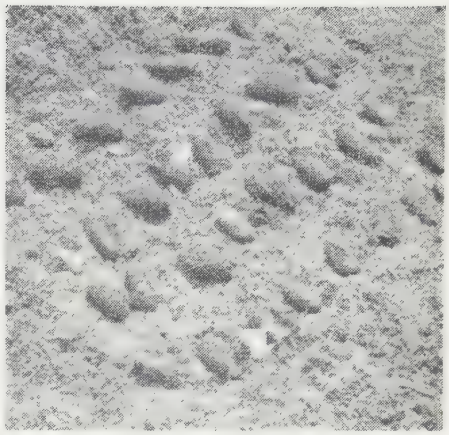
I then went on to Mauritius and Madagascar in order to obtain *Oryctophaga* as I had been instructed, although I had little hope that it would prove successful under Samoan climatic conditions. This parasite had been successfully established in Mauritius against *O. tarundus,* so I left my wife to collect on that island while I went on to Madagascar, the original home of the insect. While we were successful in obtaining and—despite the outbreak of war—in shipping a strong colony of the insect to Samoa, it failed to establish itself, although a record that it was seen a year later was probably correct.

Discovery Of Scolia Ruficornis

While we were in Mauritius a member of the agricultural staff there, Moutia, told me that there was in the Zanzibar Museum a scoliid labelled *S. carnifax* and recorded as being parasitic upon their local species of *Oryctes.* As *carnifax* was present in Mauritius, I was able to test it upon *O. tarundus,* but it was not interesting. However, upon reaching Zanzibar I realized that their insect had been wrongly named, and it was subsequently identified as *S. ruficornis,* by the British Museum.

We were then just on the brink of war, but I was able to collect a few females. Tests showed that it was a true parasite of the African species of *Oryctes.* This did not mean, however, that it would be able to use the Asiatic species as a host. By the time that we reached Singapore we were already at war, and I had some difficulty in obtaining grubs of our pest to test it with. The few tests that I *was* able to carry out were encouraging but not conclusive. I thus had to report that it would be a gamble whether it would succeed on the Samoan insect, but that I considered it a good gamble.

Towards the end of the war it became evident that *oryctophaga* had failed to establish itself, and I was asked to return to Zanzibar and attempt the introduction of *ruficornis,* which from a climatic point of view I felt had a far greater chance of success. In this work I was successful, and shortly afterwards the Americans also obtained colonies from the same source, for the Palaus. For a time the introduction in both places seemed in doubt, but about three years after they had been released the parasite appeared in numbers at a place some twenty-six miles from the point of liberation in Samoa.



RIGHT (TOP TO BOTTOM):

Parasite cocoons placed on a layer of compost. These will be covered to a depth of about two feet with more compost and left there until they emerge, when in due course they will hunt other compost heaps for the beetle grubs.

Exit holes made by adult beetles which have hatched from unparasitised grubs. It is to avoid this that heaps are now boxed and half-inch wire covers placed over them.

Pencil hole made by parasite when entering a compost heap in search of grubs to attack.

Parasite cocoons just collected out of the compost at Dravo.

This delay in the appearance of the parasite, a slowness which was also experienced in Mauritius when *oryctophaga* was introduced against *O. tarundus,* has led some entomologists to feel that this group of parasites breed too slowly ever to become of great value in the control of these beetles.

Personally I have always held the opposite view. This is based on the fact that in Zanzibar I was able to capture just on a thousand females in three and a half months, and almost all in an area of less than two acres. These females would have a minimum egg potential of 42,000, with a probable of over 100,000. In the laboratory I have found that they can go through a generation in less than sixty-six days, although the normal is considerably longer. Still, I feel that they go through at least two generations a year, so that the destruction of grubs in that area, which was an ideal beetle breeding one, must have been enormous.

Further, I feel that when a parasite is introduced for the control of a different but closely-allied host there may be a considerable amount of adjustment to take place. This is supported by the fact that when a Javanese scoliid was introduced into Australia for the control of the Australian form of *Xylotrupes gideon* there was a ninety per cent mortality of the hosts when the parasite larva was about half grown, while I had a somewhat similar but less severe experience when testing *ruficornis* in Singapore against our Asiatic beetle. I feel that this adjustment has even now not yet fully taken place because I still get occasional cases of the host grub dying before the parasite larva is fully developed. This maladjustment could be brought about in two ways; either the sting of the female parasite could be so severe as to kill, instead of paralyzing the host grub, or the salivary juices of the parasite larva could prove fatal to the host.

However, provided that there are sufficient numbers of survivors in each generation, a strain will eventually be evolved in which host and parasite are fully adjusted, and the numbers of the parasite should then rapidly increase. It seems probable to me that a similar adjustment had to take place in Mauritius when *oryctophaga* was introduced there; also that this adjustment has now come about and the parasite has increased to such numbers as to be considered the major factor in the control of *Oryctes tarundus.*

There is also another factor which must not be overlooked when considering the value of such parasites as scoliidae, and that is that it must be presumed that in their home country they themselves have enemies which reduce their efficiency there. In the case of these wasps it would generally be the pupa which was the subject of attack, and since our present colonies were obtained from material imported in the adult stage, all of these will have been eliminated, thus greatly increasing their potential value in their new homes.

Scolia Ruficornis In Fiji

In March 1953 the dreaded beetle was found to have reached Fiji, and an intense manual campaign was commenced in the hope of eradicating it. This proving impossible, efforts were concentrated in an endeavour to prevent it spreading to the main coconut-growing areas of the Group. So far these have been successful, but at very great expense.

Meanwhile efforts to bring biological pressure upon the pest by the use of general predators has not yet met with any success. This could to some extent be ascribed to the presence of the giant toad, *Bufo marinus,* which would make it very difficult to establish ground haunting species such as many carabidae. It was, however, hoped that the same difficulty would not apply to elateridae, but so far our efforts in this direction have not been rewarded.

While it is probable that most scoliids known to attack the various species of *Oryctes* would also attack ours, although they might not be able to breed successfully upon it, the only one known definitely to be able to do so and also to be suited to the climatic conditions of Fiji was *Scolia ruficornis.* This was by now fuliy established both in Samoa and in the Palaus, where the local entomologist was breeding it under semi-controlled conditions.

Through the good offices of this officer —Mr. R. P. Owen—we were able to obtain a colony of 232 cocoons, which arrived on 31 May 1958. They were immediately taken out to the field, where preparations had been made to continue breeding them along the lines suggested by Mr. Owen.

Arising from this introduction, about 360 cocoons of the next generation have so far been recovered (20 February 1959). These have all been from the compost heaps placed around the breeding site. So far, none have been recovered elsewhere, but there is no doubt that some of the parasites will have spread to the nearer villages.

Unfortunately manual and biological methods of control seldom go together. It has been necessary to compromise in certain respects, and we have had to modify our technique somewhat.

Owing to the fact that the beetle is still confined to the one island, it has been a matter of the greatest importance to reduce the chances of its reaching the main coconut areas of the Group to a minimum. To that end it was imperative that grubs used in the course of the work and which had not been attacked by the parasite should not mature and escape as adult beetles. At first we trusted to opening the compost heaps every eight weeks, but this proved too long, and adult beetles were found to be emerging.

To overcome this—and after some experiments—we have constructed boxes 4 ft. x 3 ft. x 18 ins. with iron sides and ¼-inch drainage mesh at the bottom, thus preventing the grubs we are going to use from escaping either at the sides or bottom. The boxes are then filled, covered with sawdust to a depth of about two feet, and third instar beetle grubs placed in them. After a period of five weeks the sawdust is removed to the top rim of the box. A ½-inch wire mesh lid is placed over it and the sawdust mound replaced. This should be sufficient to prevent the escape of any adult beetles while allowing any emerging *ruficornis* to escape. It should also not fully prevent the entrance of female *ruficornis* to attack such beetle grubs as may remain unparasitized. In this matter it has been found that the female parasite *did* sometimes disregard the ½-inch mesh and pass through it to the grubs beneath.

We also experienced some trouble from mongoose. In the laboratory these animals had not been interested in beetle grubs, and it seems possible that it was due to the prolonged spell of dry weather that they took to searching for the grubs, as the trouble ceased suddenly with the advent of good rain.

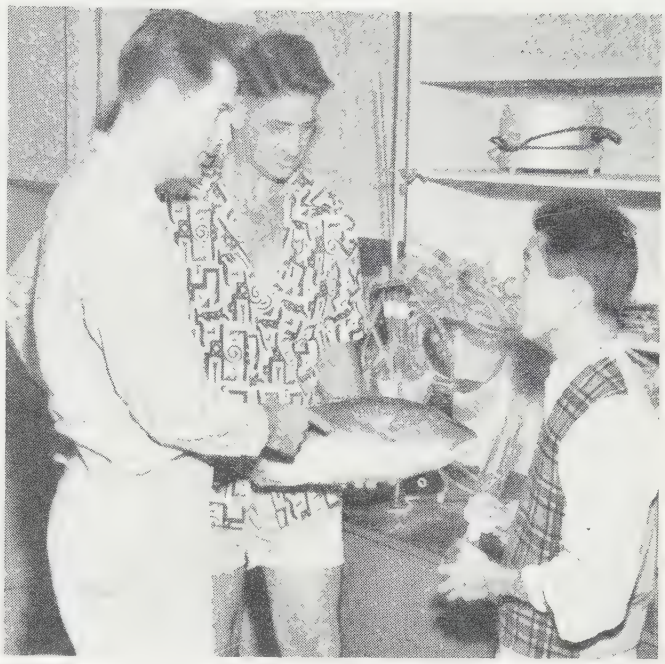
Venkatraman records mongoose as predatory upon the grubs in Ceylon, and it is suggested that the circumstances may have been similar.

Health Education Specialist Joins SPC

On May 20 Miss L. J. Martin arrived at Commission headquarters from Tasmania to take up a three-year appointment as health education officer. A week later she left for Port Vila in the New Hebrides where at the invitation of the authorities she assisted in running a short refresher course for medical dressers, particularly dealing with their training in health education.

Miss Martin's last post was that of senior psychologist to the Health Department of Tasmania. She was also consultant in health education to the Department.

Her main task with the Commission will be generally to foster health education in the South Pacific. On request from territories she will organize and take part in short health education training courses, and will assist them to develop their own long-range health education programmes.



Poisonous fish research at the Hawaii Marine Laboratory of the University of Hawaii. Above: Dr. Philip Helfrich, biologist, and Mr. Robert Morris, assistant, measuring poisonous red snappers from Majuro, Marshall Islands. Right: Dr. Helfrich and Dr. A. H. Banner (whose letter appears below), discussing one of the specimens with Dr. Satoshi Sasaki, biochemist.

Fish Poisoning Reports Wanted For University of Hawaii Study

To The Editor

Sir—Several years ago you ran an interesting article on poisonous fish in the Pacific.* Since that time some advances have been made in the knowledge of the poison, and the poisonous fish have been divided into at least two groups, those that are almost always toxic, no matter where found, and those that are toxic only in certain areas. The toxins of the fish in the first group, which include those from the puffer or blow fish, have been isolated by the Japanese; little is known about the origin, or type of toxin, and geographic spread of the fishes in the second group.

A group of us at the University of Hawaii are studying the geographic type of fish poisoning. This is found in red snappers, groupers, jacks and barracuda, and the fish are characteristically found to be toxic within rather narrow geographic limits, and harmless in adjacent areas. We are approaching the problem from two distinct aspects: on one hand we are attempting to isolate and identify the toxic components; on the other, we are trying to develop a field test that will permit us to visit areas showing this regional toxicity to determine what factors in the environment make the fish toxic.

For our studies we would like to obtain as much information as possible about the geographic spread of this type of toxicity, both for any clues it might give us as to the cause and for aid in the selection of a site for our field studies.

As your *Bulletin* is widely circulated in the tropical Pacific and comes into the hands of administrators and medical personnel, we would like to use its columns to request information about cases of this type of poisoning.

We would like to know in which areas this type of poisoning is prevalent and whether severely toxic fish are localized within narrow limits or widespread; the types of fish suspected of being toxic; the sources of information about the toxicity, whether native or medical; how long the toxic areas have been toxic, and whether they have remained consistently toxic over a period of years; and finally, any medical reports of actual cases of poisoning.

We will welcome all correspondence about the poison fish problem.—Yours, etc.,

Albert H. Banner,
Director.

Hawaii Marine Laboratory,
University of Hawaii,
Honolulu 14, Hawaii.

* Poisonous Fish Of The South Pacific, by Guy Loison, *SPC Quarterly Bulletin* for October, 1955.—Editor.

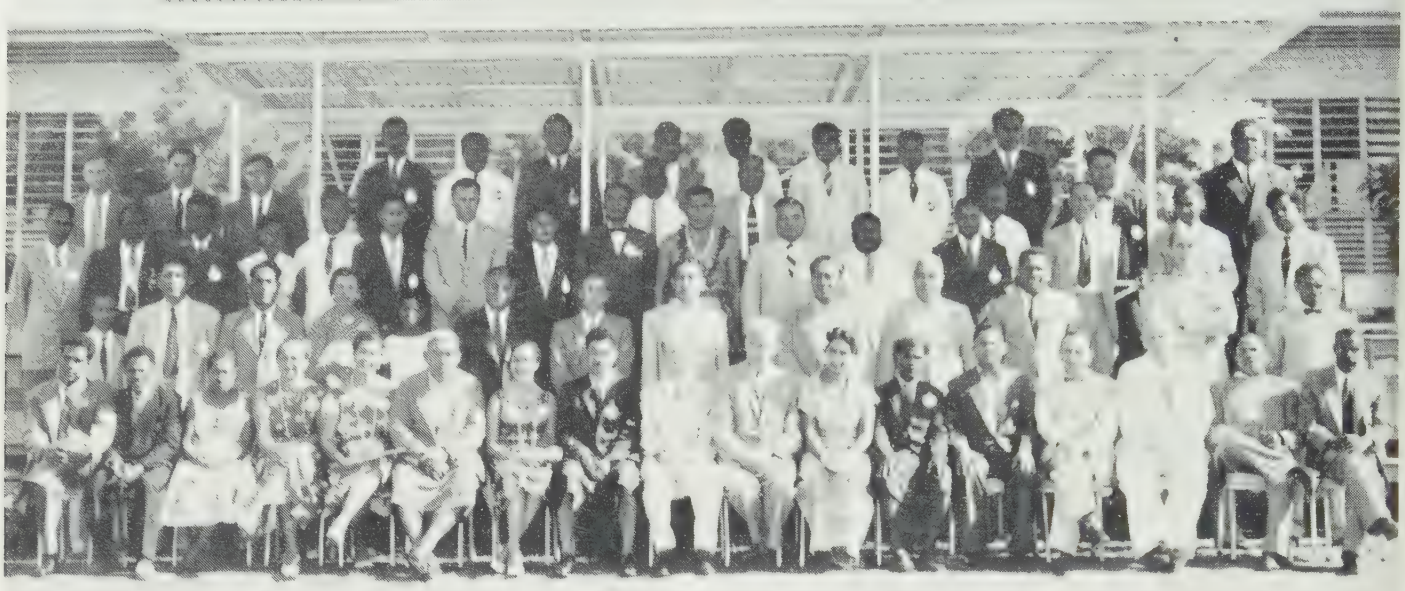
Plant Introduction In Guam And Trust Territory

Guam and the United States Trust Territory of the Pacific Islands have asked the Commission's plant introduction section to provide planting material of cash crops, including cacao and black pepper, of food plants suitable for atoll conditions, of vegetable varieties suitable for truck gardening in the tropics, and of tropic pasture plants.

Requests for this material were received by the Commission's plant introduction officer, Dr. Jacques Barrau, during a three-month visit he made earlier this year to islands of the Caroline, Mariana, Mortlock and Palau Groups. Main objects of his visit were to continue his surveys of economic plants in the Pacific, and to discuss with the local authorities ways in which the Commission could best assist them in introducing new crops.

During his visit Dr. Barrau was also able to continue the research he is now carrying out to extend breadfruit harvest seasons in the South Pacific. He studied the local varieties of the breadfruit tree, of which there is a particularly wide range in Truk and Ponape Islands.

It is now planned to introduce into the Trust Territory a selection of Polynesian breadfruit varieties, and in exchange to import for testing in Polynesia a selection of Micronesian varieties of this important food plant.



Delegates and advisers who attended the fourth South Pacific Conference, photographed with the Chairman, Mr. J. R. Halligan (front row, centre), and the Secretary-General of the South Pacific Commission, Mr. T. R. Smith (on Chairman's left).

The Fourth South Pacific Conference In Retrospect

Some impressions of the fourth South Pacific Conference held in Rabaul in April-May last are recorded below by a leading Australian journalist who also attended the second and third Conferences (held respectively in Noumea in 1953, and Suva in 1956).

By C. E. SAYERS

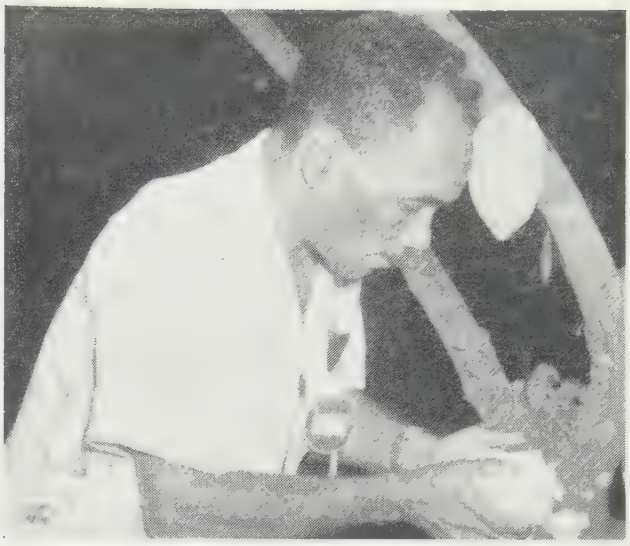
POSSIBLY the impression of the fourth South Pacific Conference that stands out most vividly in my mind is of the great confidence gained by its members since the previous meeting held in 1956. Unquestionably this sense of confidence has come from the progressively greater measure of reliance placed on them in the conduct of Conference affairs.

A glance backward at the story of the South Pacific Conference will give an idea of just what that has meant in the space of only nine years.

Conference archway over the main drive into the grounds of Malaguna Technical Training Centre. Through the arch can be seen the main administrative building, with offices on the ground floor and headmaster's living quarters above. Right: The headmaster, Mr. George Harrington (right), with Chief Mulitauaopele, interpreter to the American Samoa delegation. The untiring efforts of Mr. Harrington, his staff and students contributed very greatly to the success of the Conference.

Prince Fatafehi Tu'ipelehake of Tonga (left) and Mr. Marcus Kaisiepo of Netherlands New Guinea, both of whom have attended all four South Pacific Conferences.

Right, centre: Miss Marjorie Stewart, SPC women's interests officer, arriving at Rabaul for the meeting, which she addressed on the subject of ways and means of developing women's interests in the Pacific.



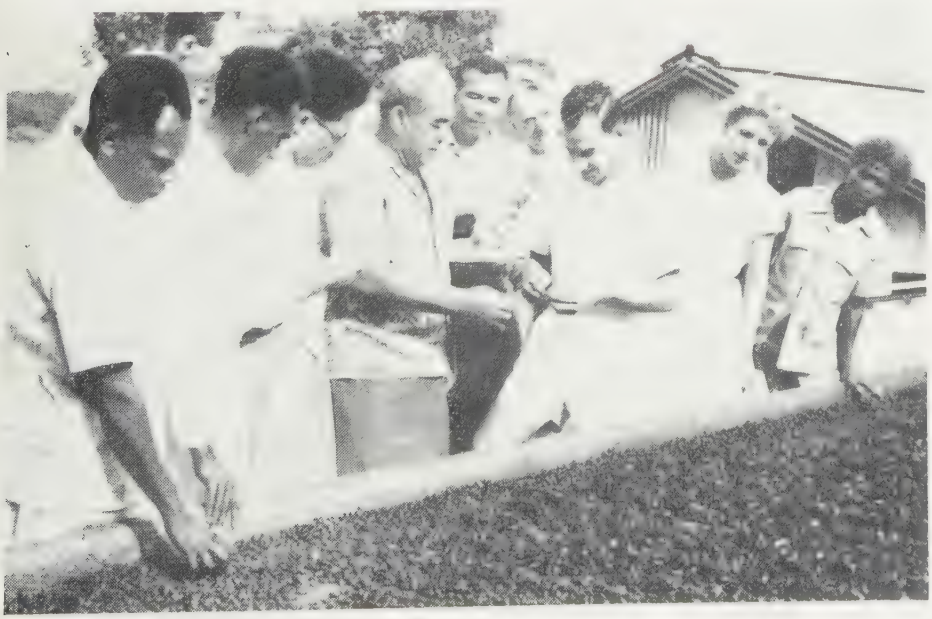
In 1950, representatives of the Pacific islands peoples came together for the a strange task. They were mostly novices first time. They met as strangers, facing in debate, often nervous and unsure; and they were obviously being led. The one thing that stood out at that first meeting was the natural dignity and courtesy of delegates. That is the one thing unchanged about the sessions of the South Pacific Conference held since 1950: that, and the absence of acrimony in discussion.

I have been present at three of the four Conferences held so far, and have come away from each of them warm in admiration of those qualities.

Other things *have* changed. At the second Conference held at Nouméa there was an appreciably different spirit, a more realistic approach to the questions asked, and to the answers given. And there were signs, then, that the island peoples were reaching out for a means of playing a greater part in the conduct of the Conference proceedings. Two suggestions for future Conferences reflected that desire; one, that introductory papers should be prepared by delegates themselves, the other, that standing committees should discuss draft resolutions.

The "standing committees" procedure was first used at Nasinu, Fiji, in 1956. It was an immediate success. If proof were needed that the men and women of the South Pacific region are able to

Delegates on a conducted visit to Kerevat Agricultural Station, near Rabaul, inspecting a tray of cocoa beans being dried in the sun. Right: Miss Tiresa Hunter from Western Samoa, who was elected chairman of the social development committee.



Netherlands New Guinea delegates listening through headphones to an address being interpreted for them. French interpreters performed a similar function for delegates from French-speaking territories. Right: Nelson Vatanglik, one of the ninety Malaguna students who cheerfully and efficiently looked after the comfort of delegates and others housed in the school dormitories. Though given only brief training in some of their domestic tasks just prior to the Conference, they provided excellent service in living quarters and mess. Nelson is training as a carpenter, one of the many trades being taught at the Centre.

conduct discussions (and reach decisions) about their social and economic welfare, it was demonstrated then. The two standing committees that were set up elected their own chairman, conducted their own discussions, drafted resolutions and submitted recommendations to the full Conference.

This procedure was again used at Malaguna this year, even more successfully. Two things possibly accounted for a large measure of that success. One was that a hard core of experienced delegates had been built up over the years (two of them were attending their fourth Conference, several more had attended three of the series). Secondly, it soon became apparent that the Conference members were seeking little guidance from either advisers or experts.

Both of those factors contributed to the success of the Malaguna meeting, and to the ever-growing value of the Conference in the affairs of the South Pacific peoples.

Again, each of the two standing committees elected its own chairman and deputy chairman. The delegates chose well; in the case of the social development committee dramatically, for here they elected a woman as their leader, Miss Tiresa Hunter of Western Samoa. Her deputy chairman was Mr. Semesa Sikivou, a Fijian member of the Fiji Legislative Council.

The economic development committee elected Mahe 'Uli'uli Tupouniua of Tonga as chairman, and Mr. Raymond Gadabu of Nauru as deputy chairman. Both were attending their second Conference.

Women Playing A Greater Part

Women are playing an increasingly important part in the work of the South Pacific Conference and in the affairs of the peoples of the region.

There was one woman delegate at the first Conference in 1950. I recall that when that number rose to three at the second Conference in 1953, and one of them urged the importance of women being well represented at future Conferences, a Polynesian delegate made the traditional response that the mother birds were more important in the nest looking after the youngsters, while the males were out on the ocean catching fish for them.

To that the chairman of the Conference, the late Mons. R. Lassalle-Séré, gallantly though realistically warned that any sceptics at future Conferences would be well advised to prepare positions to which they could fall back, for they were in danger of being overwhelmed not only by quality but also by number.

Seven women delegates attended the Malaguna Conference—three from Papua and New Guinea, two from the Cook Islands, and one each from Tahiti and Western Samoa. One Papua and New Guinea delegate and the Tahitian delegate were attending their second Conference.

Delegates In Virtual Control

The sixty-five delegates to the fourth Conference were in virtual command of the proceedings through the work both of the general committee—which decided each day's work and through which draft resolutions and recommendations passed to plenary sessions of the Conference—and of the two standing committees.

The chairman of the Conference was Australia's Senior Commissioner on the South Pacific Commission, Mr. J. R. Halligan. As an indication of the confident way the working sessions of the Conference were conducted, Mr. Halligan was called upon to preside over only five plenary meetings. Three years ago, when the "standing committees" procedure was introduced, eight plenary meetings were held, while in 1953 the second Conference held nineteen.

Mr. Halligan was the only European member of the general committee, over which he presided. The drafting of resolutions and recommendations was the work of the delegates themselves.

Two thoughts occur following reflection on the interesting two weeks of the Conference. The first is of the wisdom of the general feeling that in whatever was to be attempted in the way of social and economic advancement, it must be accompanied by education—that in most cases, in fact, education must be the primary consideration. The second thought is of the eagerness with which suggestions were made for inclusion in the agenda of the fifth Conference.

In the spate of suggestion for future discussion there was evidence of a reaching out for the many things the modern world has to offer all peoples. But one was also conscious of the fact that, from whatever part of the South Pacific region the delegates came, they were making a careful approach to questions of change from the traditional to a modern way of life.

(Continued on page 48)

The variety of dwarf coconut called "Haari haeha" in French Polynesia——

——and one of its nuts, which are green or bronze coloured.

Coconut Varieties In French Polynesia

Coconut palm improvement is a subject of increasing interest in some South Pacific islands. However, before engaging in a coconut breeding programme, one should know what are the local "varieties" and their useful characteristics. Such a study has already been undertaken in some territories. The following preliminary survey of French Polynesia indicates a possible way of approach for the preparation of an inventory of South Pacific coconut "varieties". Such an inventory could, incidentally, be a most important contribution to the world survey of coconut varieties that has been undertaken by the Food and Agriculture Organization.

By R. MILLAUD*

THE documentation available on coconut varieties is incomplete. Even so, the term "varieties" is somewhat ambiguous when applied to the coconut palm. One uses the word "variety" in relation to plant populations in which all individuals are identical to the most minute detail, and whose features are transmissible as a whole to their descendants for an indefinite number of generations.

Man is responsible for most of the varieties of cultivated plants. Nevertheless, it is possible for a variety to develop in the midst of a natural population when the latter is subjected to a certain amount of inbreeding. Other factors such as self-pollination, natural sterility (there are cases where the ovules of one individual are not responsive to the pollen of another), the geographical isolation of populations producing only a few plants in each generation, are conducive to the development of natural varieties.

Coconut Varieties

For the normal coconut the period during which the female flowers can be pollinated does not usually coincide with pollen production by the male flowers. Therefore this category of tree is mainly cross-pollinated. On the other hand, self-pollination is preponderant among dwarf

*Head of the Department of Agriculture, French Polynesia.

Left: The variety of dwarf coconut palm called "Haari papua" in French Polynesia. One of its pawpaw-shaped nuts is shown above.

This is an ornamental palm, of no agricultural value.

palms and consequently there is more inbreeding among this type of tree. Disregarding human intervention, the possibility of varieties developing is greater among dwarf coconut trees than among tall palms. One can describe any wild coconut tree. The main part of such description could easily fit individuals belonging to varieties obtained by breeding. Yet it could be possible to breed varieties whose description could not fit with any described wild coconut trees.

Therefore the classification which we are proposing, and which we are calling a "provisional classification of the coconut varieties of French Polynesia", should only be used in the light of the above reservations. It is, in fact, a classification of the known types of palms. Until proved to the contrary, each type may be regarded as the prototype of a variety which could be developed.

Provisional Classification of the Coconut Varieties of French Polynesia

I. Dwarf Coconut Palms: Usually early bearing. Their height does not exceed 10 metres. Male and female flowers on the same spadix mature at the same time.

(a) REDDISH-ORANGE NUT VARIETY ("ute-ute").

Haari papua: Tree 6 metres in height, slender stem, the surface marked with widely spaced ring-scars of leaves, topped by a sparse crown, leaves with long, thin petioles the same colour as the fruit. Nuts small, more or less ovoidal in shape, in some trees almost like a paw-paw fruit.

(b) GREEN OR BRONZE NUT VARIETY.

Haari haeha: Morphologically the brown and the green nut trees are identical. Differences in pigmentation affect only the pericarp and the spadix branches, which are green on green nut trees and red on brown nut trees. This variety of coconut palm has a short stem with a fairly bulbous base, closely spaced ring-scars of leaves, dense crown and large green petioles. The diameter of the nuts is similar to that of the nuts of the common tall trees, except that in the nuts we have been able to examine, the kernel was not so thick. However, the nuts observed were not fully mature, and further observations are required to amplify this description.

II. Tall Coconut Trees:

(a) VARIETIES WITH MEDIUM OR LARGE SIZE NUTS: Well-spaced bunches, each usually bearing under 15 nuts, commonly called *Haari teitei.*

(i) *Green nut variety Haari oviri or Haari erere:* Petioles green in seedlings, nuts green on adult plants, spadix branches also green. The indigenous populations use this variety in the preparation of medicines both for external and for internal use. (In local pharmacopoeia, the water is used mostly when the nuts have reached the "omoto" stage. The kernel is then fully grown and is of a rubbery consistency; the water is sweet and pungent; the pericarp is still full of water. The pigmentation of the fruit is that of an unripe nut.) We observed 16% of this type of green nut palm on one plot of land. On the other hand, germinated nuts from green, yellow or red nut trees have been known to produce seedlings with a green pigmentation. Such results show that one cannot properly speak of a green nut variety of coconut palm.

(ii) *Yellow nut variety—Haari ute-ute:* Seedlings with pale green petioles, yellow or green spadix branches, full-size nuts yellowy-green in colour, variable in shape. On a typical tree the

nuts are small but the kernel weighs approximately 320 gr.; average size of fruit 24.7 x 17.9 cm. On the above-mentioned plot of land we observed 49% of yellow nut palms.

(iii) *Red or brown nut varieties—Haari ute-ute:* Seedlings with red petioles, red or brown spadix branches. There were 35% of this type of tree on the same plot.

(b) SMALL NUT VARIETIES: The bunches are crowded and the nuts thickly packed on each bunch. When fruiting the tree is heavily laden. The coconut sap is very sweet. *Haari teitei,* type *reita.*

(i) *Haari reita, sub-type rarahi:* Medium-size fruit, 19.8 x 13.5 cm.; 31 female flowers were counted on one spadix.

(ii) *Haari reita, sub-type hua* (*syn. Haari kiki*)*:* Large quantities of small fruits of varied pigmentation—*Haari reita* proper —size of fruit, 17.2 x 9.4 cm. The apex of the nuts observed was terminated by a nipple. This characteristic is not present in all fruits from this type of palm, and the average size is therefore shorter than the above measurements. Thirty female flowers on one spadix were counted.

III. Odd Or Unusual Forms:

(a) PALMS with fruits well detached from the spadix.

(b) PALMS of which the nuts contain a thick paste called *haari pia* (pia = starch) instead of kernel and water.

(c) FIBRE PALMS: Very elongated nuts. The kernel often fails to develop—*Haari nape.*

(d) PALMS WITH SWEET, EDIBLE HUSK —*Haari ahnahupuru* (called *kaipua* in the Tuamotu Group).

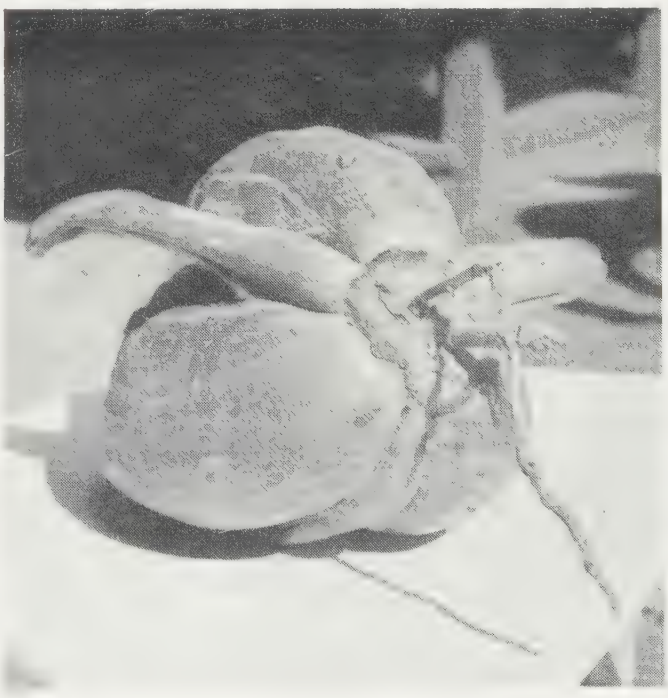
(e) PALMS WITH SESSILE FLOWERS: All the flowers are clustered on the unbranched spadix. The inflorescence can be compared to an ear of corn. There are a few male flowers near the end of the spadix. F. B. H. Brown, in FLORA OF SOUTHEASTERN POLYNESIA (pp. 127-128), has linked this variety (reported by C. Henry, QUELQUES VARIATIONS DU COCOTIER COMMUN (COCOS NUCIFERA L.), L'AGRONOMIE COLONIALE—August 1920, No. 32, p. 52) with the genus *Diplothemium.* In the district of Hitiaa a planter put in 200 nuts from this type of palm, but in spite of this, most of the trees on his plantation are of the common type. Mr. Stein, a field officer with the Department of Agriculture of French Polynesia, who told me this, has also observed coconut trees of

(Continued on page 48)

Right: Another "Haari haeha" dwarf coconut palm.

Below left: A coconut palm with sessile nuts (i.e., attached directly by the base, without stalk.)

Below right: The strange-looking horned coconut called "Haari tara" in French Polynesia.



A Travelling Library For The Solomons

In 1957 the Administration of the British Solomon Islands Protectorate sought the Commission's aid in setting up a travelling library in its territory. The Commission's Literature Bureau was given the three-fold task of selecting and purchasing the books, devising the containers, and planning the organization of the library. How this was done is described below . . .

By W. A. ALLISON*

The contents of one book box, here displayed in front of the ten boxes comprising one mobile library, illustrate the wide variety of literature provided.

AS in many other Pacific territories, the pace of economic and social development in the Solomon Islands has accelerated since the war. An expanding, more intensive system of primary school education has been adopted, and is resulting each year in a steadily-growing proportion of Solomon Islanders who can read.

A corresponding need has been developed for reading material, and in 1957 the Administration sought the aid of the South Pacific Commission in setting up a travelling library. It was to comprise separate mobile units that could be moved around among various centres, where they would be placed in charge of responsible persons.

The Commission granted £stg.1,000 for the activity on the understanding that it would be carried out as a pilot project, to benefit other territories with a similar problem. The Commission also expected to receive regular reports on the library, in particular on any success achieved in getting people to contribute towards its upkeep.

SPC Literature Bureau Given Task

The Commission's Literature Bureau was given the three-fold task of selecting and purchasing the books, devising the containers, and planning the organization of the library.

After studying the problems involved and resources available, the Bureau recommended the setting up of twin libraries, each containing about one thousand books. It also urged that from one-quarter to one-third of the monetary grant should be held in a fund for replacement and maintenance costs, which it was considered were likely to be high under the primitive conditions of transport and housing.

It had been stressed that the books were not to be school books, to teach people to read, but rather to cater for the reading demands of educated Solomon Islanders. Among the latter, reading tastes and levels of ability vary widely. Many who have received anything from four to eight years' schooling represent a considerable age span and variety of background experiences and interests. There is also a more educated group—which includes teachers, clerks, nurses, medical officers and others—with more advanced reading tastes and greater reading ability.

Enquiries revealed that the Solomon Islanders showed a preference for stories of the Pacific, followed by simplified editions of stories from outside the Pacific, and then books describing the life, customs and conditions of other people, particularly those similar to themselves.

Book Selection Problems

A combination of many problems made the selection a thorny task indeed. Books produced for European readers often fail to arouse the interest of the Solomon Islander because much of the content is beyond his comprehension. Few writers, and fewer publishers, are able and willing to produce books to suit such communities. (This obstacle may be surmounted only when authors develop among the islanders themselves.)

The Literature Bureau shelves were searched, and it was surprising how few books seemed suitable after those with too strong a school flavour had been discarded. Sydney book shops were visited and publishers' catalogues searched, but we were still far from our goal of one thousand titles. Repeatedly it was necessary to widen our choice and to study again all existing sources. Many books justified inclusion because of specially proficient readers—admittedly very few—who may appreciate them.

Illustrations are always helpful, and a fairly liberal issue of the modern, colourful, illustrated encyclopaedias was included in each box. Several full sets of the Literature Bureau's own productions were included.

* Mr. Allison is a member of the editorial staff of the South Pacific Commission's Literature Bureau. He was formerly Director of Education in the Cook Islands

CIRCULATION RECORD

B.S.I.P. MOBILE LIBRARY M. L. 2.

Box .... containing ... .. books, was despatched from Control Centre on Circuit ..... to Reading Centre

Signed by .....

Date .....

To the Person in Charge of each Reading Centre:

1. When you open the box please count the books and fill in first three columns on next line. (See below). Columns (1), (2), and (3).
2. Before despatching books please count them and complete your line below by filling in last three columns. Columns (4), (5), and (6).
3. Place this form in its envelope and put it in the box with the books

Reading Centre (1)	Date Received (2)	Number of books (3)	Date Despatched (4)	Number of books (5)	Signature of Person in charge (6)

B.S.I.P. Mobile Library M. L. 3A

Book Box Checking List

To: the Person in Charge
Each Reading Centre

A ..... page list of all the books in Box ..... is attached for you to check

1. Please write the name of your Reading Centre at the top of one column
2. Check each book in the box by making a mark like this / If the book is not in the box write O.
3. When the books are ready for sending on, check each book again by crossing the first mark like this X. If the book is missing write L beside the mark, like this /L
4. Send this sheet in its envelope inside the box with the books to the next Reading Centre

Study the Sample below and see how to fill in your column on the lists which are attached

No	Title	Reading Centre: Auki	Buma								
56	Heroes of Olden Days	X	X								
3	Sweden	X	X								
72	Robinson Crusoe	X	X								
126	Pictorial Encyclopedia	/L	O								
128	Science Encyclopedia	X	X								
etc.	etc.	etc.	etc								

NOTE: This cover sheet of instructions should have the introduction completed at the Control Centre, and one copy should be attached to the Book Box List of books. M. L. 3

Two of the eight forms designed to ensure efficient running of the library.

Fiction, biography, novels, short stories, factual stories, popular science, technical books, and simplified editions of classics were all represented.

The final figures—1106 titles, making a total of 2493 books—were a surprise to us all.

Preparing The Boxes

Although it had been agreed there would be ten units in each circuit we decided to increase this number to twelve to allow two units to be held in reserve.

Our first enquiries were directed to factories manufacturing aluminium containers. The quotes were alarming. The highest was £155 for a barrel-shaped, watertight container large enough to hold 100 books. Another price of £28 for an oblong case with hinged watertight lid was certainly much lower, but it was still too expensive.

We settled for ex-Army ammunition cases, strongly made of steel, well fitted with excellent handles at the ends. Measuring 20″ x 17″ x 10″ deep (outside dimensions), they cost 30/- each. Another 10/- per case covered a repaint.

At this stage, of course, we had not received our books and could only hazard a guess as to how many books a case would hold. We felt certain of 80, but because of the small size of some we managed to pack over 100 in each unit.

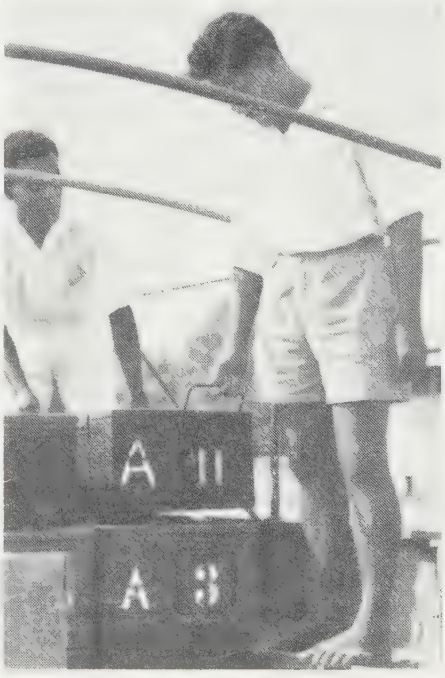
The iron cases will take a maximum of rough handling on ships, in boats, over reefs, and along rough bush tracks. They have been waterproofed by fitting each with a strong, light, inner case of marine plywood, reinforced around the top rim, corners and bottom seams. The lids are clamped on with wing nuts. Waterproofing has been achieved by using water-resistant glue in the construction, and by fitting a layer of ribbon rubber around the reinforced top rim. Finally, each inner case has been painted inside and out with a good enamel paint claimed to give protection against seawater.

Twenty-two units were assembled in

(Continued on page 48)

Left: The plywood inner case being fitted into its metal box. The triangular markings ensure correct matching of lid holes with case bolts. The larger plywood case with hinged lid (later fitted with two locks) is one of two made up as an experiment.

Right: The libraries being unloaded at Honiara.



Above: Four-year-old cocoa trees under Leucaena glauca shade on one of the first three experimental farms established by the Department of Agriculture. Right: Young bearing cocoa tree.

NIMBORAN – 1959

In 1952 a Commission-assisted community development project was launched in the Nimboran region of Netherlands New Guinea under the supervision of District Officer W. J. Kouwenhoven, with general guidance by a supervisory board in Hollandia. The project as it was originally planned came to an end in December 1954. The main activities continued, however, and in the following May a co-operatives inspector was appointed and stationed at Nimboran to assume charge of a modified and partly re-directed project. This article gives news of subsequent progress and change. It results from a visit to the Nimboran area by the Commission's co-operatives officer, Mr. R. H. Boyan, accompanied by the co-operatives officer for Netherlands New Guinea, Dr. P. J. van Dooren.*

By P. J. VAN DOOREN and R. H. BOYAN

THE principal economic aspects of the original Nimboran community development project were the co-operative store, co-operative marketing through the store, and the communal farm, which was partly mechanized.

The main changes that have developed since 1954 are that the communal farm as such has been abandoned and individual holdings established instead, and the conversion in 1957 of the original communal farm to a cocoa project owned by the Co-operative.

The existence of the Co-operative store has been continuous and graph No. 1 illustrates its progress. Figures of the value of produce handled by the store in its role of a co-operative marketing organization follow a slightly different pattern; as indicated by graph No. 2, a recession is followed by a recovery. However, some distortion exists, as prices were higher in the early period.

An analysis of the types of produce handled is of significance. The 1958 figures are:

	Kilograms[1]
Sago, wet	10,240
Sago, baked	35
Coconut oil	563
Peanuts, shelled	253
Peanuts, unshelled	3,415
Peas	2,190
Corn	155
Rice	1,324
Coffee	7
Kapok	34
Pork	2,895
Salt dried fish (ex coast)	1,572
Shrimps (ex coast)	131
Timber	3.14 cu. m.
Atap (thatch)	508 sheets

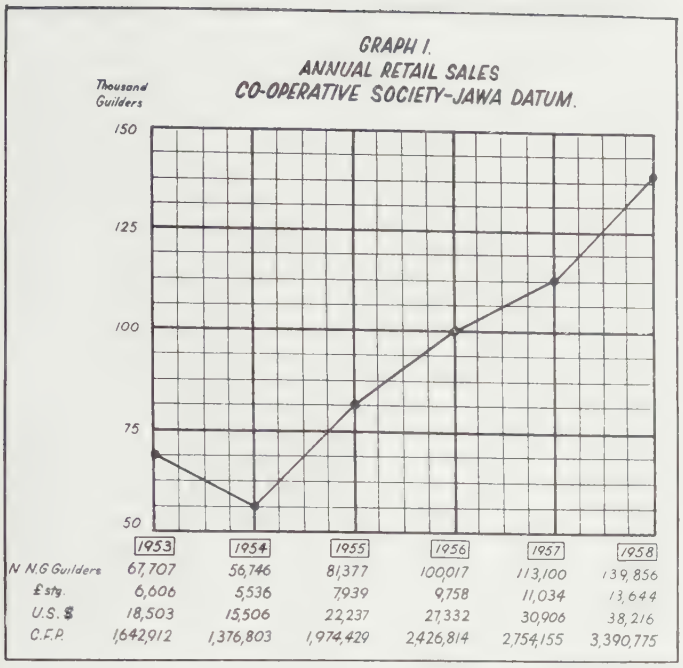
[1] One kilogram equals 2.2 pounds.

The above analysis indicates several significant aspects of economic development.

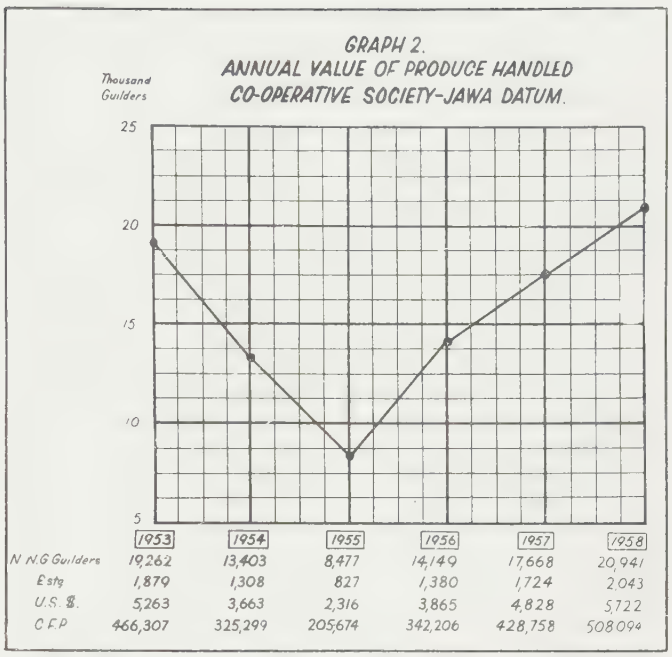
The presence on the list of peanuts, peas, corn and rice directs attention to changes in the farming pattern as part of the development project. Part of the change was forecast by Dr. Kouwenhoven, who wrote:

"The further agricultural development of Nimboran was to be undertaken by means of the gradual introduction of individually-conducted farming enterprises next to the existing mechanised farming enterprise. Each farm was to be about 5 hectares in size. A part of the farm was to be used for the cultivation of annual food and cash crops.

* Dr. Kouwenhoven's final report on the project was published in 1956 under the title of Nimboran: A Study Of Social Change And Socio-Economic Development In A New Guinea Society. A review by Professor H. Belshaw, Macarthy Professor of Economics at Victoria University of Wellington, New Zealand, appeared in the *Quarterly Bulletin* for January 1958.



	1953	1954	1955	1956	1957	1958
N.N.G. Guilders	67,707	56,746	81,377	100,017	113,100	139,856
£ stg.	6,606	5,536	7,939	9,758	11,034	13,644
U.S. $	18,503	15,506	22,237	27,332	30,906	38,216
C.F.P.	1,642,912	1,376,803	1,974,429	2,426,814	2,754,155	3,390,775



	1953	1954	1955	1956	1957	1958
N.N.G. Guilders	19,262	13,403	8,477	14,149	17,668	20,941
£ stg.	1,879	1,308	827	1,380	1,724	2,043
U.S. $.	5,263	3,663	2,316	3,865	4,828	5,722
C.F.P.	466,307	325,299	205,674	342,206	428,758	508,094

The choice of a suitable perennial crop fell on cocoa.

"Before individual farming would be introduced on a larger scale, three experimental undertakings were to be established close to the co-operative farm. The mechanical equipment of that farm was to be employed also on these three experimental farms.

"The initial expenses for the individually-owned farms were to be paid by the Government. A special fund would be created for this purpose, which was to be paid into the account of the Co-operative Society. The debt thus created towards the Government would have to be redeemed gradually by the individual farmers out of the profit for their sold products".

Several of the accompanying photographs show views of these experimental farms in May 1959. Cocoa trees planted out on 3½ hectares[2] in 1955 have begun to bear, and marketing will commence in 1960. The three men who occupy the three farms were Nimboran men selected from a group attending a one-year extension course at Serui, near Biak. The cost of hiring mechanical equipment from the Co-operative has been partly paid from the proceeds of cash (annual) crops, and the balance will be paid from the proceeds of cocoa. A similar arrangement exists in regard to cattle, pigs,

[2] One hectare equals 2.5 acres, approximately.

Above: Type of house built for the holders of the eleven experimental farms in Nimboran. The houses have a frame of sawn timber, walls of sago mid-rib, and a zinc roof. Right: Near Nimbokrang village, logs are sawn into lengths suitable for pit-sawing.

Above: Dr. van Dooren (left), with Mr. Thooft, District Officer, Genjem, and Mr. Bezalski, Agriculture Extension Officer, inspect land on which cocoa will be grown. Right: Though not two years old, this cocoa tree on the communal farm is bearing.

housing and fencing supplied to each farmer.

Encouraged by the results of the first three experimental farms, the Agricultural Department in 1957 sponsored an additional eleven holdings allocated to a further group of Nimboran men who attended a later course at Serui. These are slightly smaller in area because it was found that the original holdings were too large for one man (and his family) to handle.

Of each holding, 2 hectares were to be laid out in cocoa, 1 hectare reserved for cash crops (annuals) and food crops, and ¼ hectare for the home area and fruit trees. (In addition there is a reserve of 1 hectare for future use if it is found the occupier can cope with a greater area).

Initial clearing on these eleven holdings was done with the Co-operative machinery. Shade trees (*Leucaena glauca*) were then planted, along with some annuals (food and cash crops). As the *Leucaena glauca* provided enough shade, cultivation of annuals on the area reserved for cocoa ceased, and cocoa trees were transferred from a nursery to the field.

A rotation system is followed for annuals. Fruit trees are planted near the house, and there is a chicken enclosure nearby.

As from September 1955 individual farms were developed on a slightly different basis. Mr. Ormel, the Co-operatives Inspector posted to Genjem in May 1955, suggested to Wilhelm Hamonkwarong the establishment of an individual farm on his own land to grow peanuts, sweet potatoes and peas. The suggestion was adopted and the machinery hired from the Co-operatives.

Two harvests were made before the onset of the wet season. The sweet potato and some of the peanuts were eaten, while the remainder of the harvest was sold. Sales proceeds were 1,700 guilders, from which 584.25 guilders were paid to the Co-operative for the hire of the mechanical equipment.

Mr. Hamonkwarong was so satisfied he repeated the experiment in 1956 and in subsequent years, but with the modification that shade trees were planted with the annuals. As the shade became adequate, cocoa was planted, and an additional area taken over for annuals. Now 3½ hectares are under thriving cocoa, and production of annuals has ceased.

This pioneer now receives an income as storekeeper at the Co-operative store, and soon will be receiving a substantial income from cocoa.

Other people gradually followed his example, though with some minor variations, and there are now 120 individual holdings (not counting the 14 sponsored by the Agricultural Department) with an estimated area of 100 hectares under cocoa or under shade in preparation for cocoa. There has been a tendency towards a planting of cocoa more quickly after clearing; some people have even cleared by hand and foregone the annual cash crop stage.

While most of these holdings have been established on the farmers' own land, in some cases land has been rented (on occasions following attempts at squatting, and ensuing arguments). But emphasis is on development without help except, in most cases, the supply of the Co-operative's agricultural machinery on a "pay-later" basis.

Communal Farm Converted

At the same time as individual farms were being developed in 1955-56, the cultivation of annual cash crops on the communal farm continued, but against ever-increasing difficulties, including steady financial losses. An historical perspective indicates that a communal farm did not appeal to the people and they were not anxious to work there; individual holdings, in relation to which the Co-operative was a service and marketing organization, seemed more in line with the traditional cultivation patterns of the people.

Towards the end of 1956 Dr. van Dooren assumed the post of Co-operatives Officer for Netherlands New Guinea. In December 1956 he visited Nimboran, and as a result of his visit suggested that the communal farm be converted to a cocoa project owned by the Co-operative. This suggestion found favour, and the change-over was begun in May 1957. There are now 13 hectares under cocoa and the first pods are appearing on the 19-month-old trees.

In total, there is an area of over 130 hectares under cocoa, and under shade prepared for cocoa. Associated therewith are areas of annual food and cash crops largely grown on a rotation rather than a shifting cultivation basis.

(Continued on page 46)

Above: A large crayfish taken by spear during a reef fishing expedition. Overall length of body and antennae was four feet. Right: The author with crayfish and grouper, taken with an early model speargun of Australian manufacture, long since superseded.

Spearfishing In Pacific Waters

Pacific islanders living near the sea have long been adept at the art of fishing with spear and goggles. Fortunately, much less skill is needed for this fascinating sport if modern gear is used—powered spear gun, face mask, snorkel and flippers.

By ROB WRIGHT*

THERE is little doubt that the Pacific islanders were among the first people to introduce spearfishing to the world. Or perhaps their activities could be termed "fishing with a spear", for that is what they did. While techniques in the various islands differed, the basic equipment for underwater fishing were small goggles meticulously carved from wood, bone or some similar substance, and a long-shafted spear with a steel tip.

In fishing operations the islanders used canoes to convey them to the reefs. Here they donned goggles and with a twelve-foot spear in hand, slid over the side of the craft to scan the sandy areas among the coral heads. When fish were spotted they dived downwards with the spear used as a lance, and impaled the prey. More often than not, more than one spear was used to subdue large specimens, for it was not uncommon for fishermen to capture 100-300 pound fish by this method.

This then was the start of spearfishing. The advantages of this form of sport were soon to be appreciated elsewhere. The Japanese began producing goggles for pearl diving, and these were pounced on eagerly by newcomers in the field.

But if the Pacific saw the first spearfisherman, it was the Mediterranean and its environs which saw newer experiments being made in the field of underwater research. Commander Corlieu of the French Navy was the first person to perfect rubber swim-fins to increase swimming speed underwater, and he brought his invention into operation in 1926. In combination with goggles, this gave the spearfisherman a decided advantage in undersea work. Le Prieur, another Frenchman, is credited with developing

*Mr. Wright, who is the official photographer attached to the Public Relations Office in Fiji, also conducts a popular Saturday feature for amateur fishermen in the *Fiji Times* entitled HOOK, LINE AND SINKER.

Above: A catch of reef fish taken with a speargun. Right: A spearfisherman stalking a fish in the clear shallow waters of a coral reef.

the snorkel or breathing tube which is so much in use today.

The early thirties saw a fillip to spearfishing in the Atlantic zone. Guy Gilpatric, author of the "Glencannon" series of stories which ran in the *Saturday Evening Post,* became enamoured of the new sport, and wrote a book called *The Compleat Goggler* which influenced thousands of people in the United States. Underwater catapults were being developed—forerunners of the modern speargun.

The advent of World War II brought a temporary halt to spearfishing and diving as a sport, but it did serve to develop "frogmen" and underwater breathing apparatus which enabled divers to stay below for long periods of time. Coupled with this advance was the development of underwater photography.

At the end of hostilities there was a tremendous surge of enthusiasm for the new sport, and, with the perfection of new equipment, adherents were to be found in almost every country in the world.

Anyone who has sat through an underwater movie will have thrilled to the fantastic world under the sea; the exotic fish and beautiful corals, to say nothing of the larger inhabitants of the deep which have appeared in front of the camera lens. Yet all this is well within the scope of the average person, who needs only to buy a limited amount of equipment to set him up in the sport of spearfishing.

In the Pacific islands this is particularly easy, for coral reefs abound, and where there are reefs there are fish. A person does not have to be a first-class swimmer to indulge in this sport; indeed, one need not swim at all if the elementary approach be tried. There are hundreds of shallow pools on the reef which will furnish exciting pictures of fish and corals with no more effort required than sitting in a bathtub at home. There is also less danger. One can slip in a bathtub.

Face Mask And Snorkel

For the beginner, the sole requirements are a face mask and snorkel. The snorkel may be omitted, but it will save lifting the head every time a breath is needed, and any sudden movement will scare fish which are around. To enjoy the greatest comfort, choose a mask which will fit the contours of the face snugly when the headstraps are adjusted, and make sure that the edges which come in contact with the face are soft and flexible. There is nothing worse nor more uncomfortable than a mask which literally digs into the skin.

Once the mask is in place the wearer should try breathing in through the nose to check if it is watertight. Breathing in this manner will create a vacuum, and if air enters so will water. The straps should be adjusted until this no longer occurs. Testing the mask in shallow water will facilitate mouth-breathing exercises. It will be found that after a short period of use the glass will cloud over much the same as a car windscreen does when the windows are closed. A slice of raw potato, tobacco juice, or plain spit rubbed on the inside and then sluiced with water will tend to keep the glass clear.

The snorkel is a tube of plastic, rubber, or metal which is turned up at the bottom in the shape of a "J". The short, upturned piece has a plastic or rubber mouthpiece which fits inside the mouth and is held in position by the teeth. When the head and mask are submerged, the top section of the snorkel remains above water and so enables the wearer to breathe easily through the mouth without lifting the head. In this manner it is possible to give undivided attention to what is happening beneath the surface.

Swim Fins The Next Item

Swim fins are the next item for the spearfisherman. There are innumerable makes and designs on the market. If the swimmer is going to operate on a coral reef, it is advisable to procure a pair with a full foot so as to minimize the possibility of coral wounds in the feet. Like the mask, the fins should fit well but not too tight. A flutter kick such as is used in swimming a crawl stroke is best. They will take a short time to get used to, but will increase speed by anything up to fifty per cent.

When a swimmer gets accustomed to operating beneath the surface, it will be found that to remain comparatively still requires exhaling most of the air in the lungs and holding on to a piece of coral to offset the tendency of the body to rise to the surface.

It is essential when stalking fish to create as little movement as possible. To make this easier and to counteract the natural buoyancy of the body, a lead belt is a great help. This enables a person to sink without too much effort, and to remain at a determined depth for as long a period as desired. Lead weighing from half a pound to a stone is said to be about the normal requirement, which depends on the buoyancy of the diver. Enough lead to be neutral in the water is fine. (One precaution with lead belts —make sure they have quick-release catches. There may come a time when this might mean the difference between life and death.)

The Speargun

There are literally dozens of spearguns on the market to satisfy the requirements of the most fastidious hunter of fish. There is everything from the simple Hawaiian sling, to rubber-, spring-, gas- and hydraulic-powered models, and a gun which is fired with the cap from a pistol.

The easiest and simplest form is the Hawaiian sling. It employs a short

Above: A coral trout struggles to break away after both spear and cord have passed through its body under the dorsal fin. This species of fish is excellent eating. Right: A six-foot shark swimming along a reef edge—a familiar sight to experienced spearfishermen. It swam under the photographer who did not know it was there until it appeared in the viewfinder of his camera.

length of hollow bamboo tube to which is attached a loop of rubber joined by a short length of nylon cord. The spear is about a five-foot length of ¼" or 5/16" steel which has a barb on one end and the other end notched to take the nylon. It is a simple matter to fit the spear to the cord and pull both back as far as possible in the manner of a bow and arrow. The Hawaiian sling is elementary but efficient. The only drawback is the loss of a spear if a king-hit is not registered on the fish.*

Perhaps the most popular type of gun on the market is rubber-propelled, either with single, double, or triple rubber cables, depending on the power required. A double rubber gun will account for most fish up to about thirty pounds. There are several guns of this type made with a wooden stock, which has a very distinct advantage in that, after firing, the gun can be released to float in the water while the fisherman gives his whole attention to mastering the fish on the spear.

Rubber-powered guns are usually balanced to be of neutral buoyancy in the water. They are held out in front of the spearfisherman in much the same manner as a pistol, although experienced hunters are able to "shoot from the hip" in traditional Western style if the need arises.

Spring guns seem to have the approval of most divers on the Continent, which is where they first came into operation. They are usually longer than the normal rubber gun, and are charged by thrusting a spear down the barrel until it engages in the trigger mechanism. Spring guns are efficient, but require much more care than any other type. They have to be washed carefully in fresh water and then thoroughly greased and oiled.

Spearfishing Technique

Having become equipped with mask, flippers, snorkel and gun, all that remains for the spearfisherman to learn is technique, and this is perhaps the most important part of the whole business. No amount of fabulous equipment will make a person successful in underwater hunting unless he is able to evolve a skill which can only be developed by patience and practice.

One thing the spearfisherman in the Pacific has to learn is that fish habits are slightly different from those in more temperate zones. Around the reefs, fish are far more scary and have to be systematically stalked most of the time. To do this the hunter must use the least possible movement, and when the prey is sighted, he must approach it slowly and, if feasible, on about the same level.

Hold the gun at arm's length while moving in on the fish, and aim for a spot slightly behind the gill plates and above the pectoral fin. This is a vulnerable area in most fish, and if it can be penetrated at close range there is little doubt but that the shot will be completely successful. Even if the shot is not fatal to the fish, the shocking power of the spear hitting in this spot will in most cases paralyse the fish so that it is easily boated.

An ideal range for underwater shooting is about five or six feet, so it is always desirable to close in to this distance before firing. If, owing to circumstances, the fish is hit in the body, a struggle will take place. This will invariably excite predators in the area, so it is good practice to concentrate on overpowering the prey and trying to get it out of the water as soon as possible. If a wooden-stock gun is used, let the gun go and devote all energy and both hands to the cord and spear. If the gun is a metal one, hold it high and take in cord with the other hand.

One of the great advantages the spearfisherman has over other forms of fishing is that he can actually see and select the fish before shooting. And as there are generally plenty of fish to choose from, make it a habit not to shoot everything in sight, but to take only the type of fish known to be edible.

When working on coral reefs there are invariably caverns and grottoes beneath the main outside ledge—some of large proportions. On a rising tide, fish of all types will frequent these caves, and it is possible to collect a full day's bag in one. Dive slowly and inspect every ledge—it is surprising how a big fish can hide under a small obstruction—but make sure not to become confused and forget where the entrance is.

When spearfishing from island reefs there will be very few occasions when sharks will not be encountered. Many species of these frequent coral passages, and will be on hand when fish are taken by the gun. Screeds have been written about shark habits—some good, some bad. In general, sharks are creatures of habit and seek food in every little nook

* A sketch showing the construction of an Hawaiian sling appears in Mr. Wright's article, AMATEUR FISHING IN THE PACIFIC ISLANDS, appearing in the *Quarterly Bulletin* for October, 1958.—Editor.

Above: A Fijian boy wearing the type of goggles first used in spearfishing, with a tilapia shot in the upper reaches of the Wainimala River. Right: A spearfisherman cleans his catch—a barracuda.

and cranny they can get into. Fortunately a coral reef has an abundance of food for them so that, in the main, they are not particularly interested in spearfishermen as an item of diet, although there have been numerous instances where they have taken fish from spears. Nevertheless, sharks are unpredictable, and it is good practice to keep a wary eye on their movements while they are near. Take every speared fish onto the dry reef or into a boat as soon as possible.

Perhaps one of the greatest personal hazards on a coral reef is from the coral itself. No matter how carefully a diver operates, in some manner or other he will end the day with a number of scratches, abrasions, and perhaps stinging weals from millepora and other toxic types. It is a wise precaution to bathe, and give even the tiniest scratch the best of attention. Mercurochrome is a fine antiseptic for this.

A Few "Don'ts"

Spearfishing is one of the most fascinating sports in the world—if it is practised intelligently. It is educational, refreshingly diverting, and rewarding. Here are a few "don'ts" for the newcomer to the game:

DON'T spearfish without first testing your gear.

DON'T load or unload a speargun on land or in the vicinity of other people. Always load it in the water when you are about to commence fishing.

DON'T attempt long shots at fish which may result in wounding them and attracting predators.

DON'T shoot at fish which you don't intend to use. Strive to pick edible fish only.

DON'T string fish on a cord around your waist or near your body. Always take them out of the water as soon as possible.

DON'T fish in murky water where visibility is limited to a few feet.

DON'T spearfish alone. Always have a partner with you.

DON'T forget coral scratches. Treat them when you get home.

DON'T forget your equipment when through with diving. Wash well in fresh water and dry before storage.

NIMBORAN—1959

(Continued from page 42)

The economic pattern is not restricted to the cultivation of cocoa, rice, sweet potatoes, peanuts, corn and peas. There is extensive consumption of sago, and the analysis of the store's handling of produce shows that additional sago is produced for sale within the sub-district.

The analysis also shows the usefulness of the store as a centre of exchange for other products. The 2,895 kilograms of pork came from wild pigs hunted and killed by the people from the outlying sub-region of Unurum (Guay). Coffee beans and ground coffee comes from Warombaim village; kapok from various villages.

The timber handled by the store is the result of a part-time pit-sawing venture initiated by a clan which, under the leadership of Mr. Apolis Waibro, established a new village at Nimbokrang. The whole venture was established without external aid. The work involved included the clearing of a road three kilometres long so that a truck could transport the sawn planks.

Bread is sold by the store. It is bought from a baker to whom the store supplies flour on credit. Dried and salt fish are bought from small co-operatives on the coast. Daniel Demotekai's carpentry shop, described and illustrated by Dr. Kouwenhoven in his report, still operates. All loans for equipment (over 5,000 guilders) have been repaid.

Social Development Aspects

And what of social development? It appears to have been the hope that sound economic development resulting from the project would lead to spontaneous generation of social improvement activities. At the same time, however, specific undertakings were continued or commenced, as for example the dispensary and the girls' school. These continue today.

The economic development is perhaps too recent to have stimulated extensive spontaneous social development, but there are indications such as improved housing, purchase of furniture, improved cleanliness and hygiene, and improved nutrition (an example of which is sale of baby food in the Co-operative store).

Encouraging Overall Picture

Nimboran is not a Utopia—not yet, anyway. Problems continue to exist and develop—the need for a permanent road to Hollandia, flooding and drainage, land tenure, abstainers from the project—these and others spoil the picture, and the maintenance of sound economic and social development will continue to demand determination from the people of Nimboran and wise supervision and assistance by the District Officer and Co-operative staff.

But the overall picture in Nimboran, 1959, is one of past progress and a favourable atmosphere for accelerated development, both in the economic and social spheres. Progress results in future years should contain many pointers for under-developed areas.

Dr. Kouwenhoven's fears for the project as expressed in his report were not realized. Because they were not, great credit is due to him for having laid the foundations of an experimental project which, despite weaknesses uncovered by time, were sufficiently soundly based to permit the necessary adjustments and so ensure progress.

Educational Visit To Western Samoa And Fiji

The Commission maintains a small fund to assist study visits by territorial education officers to other parts of the region. Such a visit—to Western Samoa and Fiji—was undertaken last year by the Education Officer of Niue, who in this article records his impressions of his tour.

By C. W. FLAVELL

On his tour Mr. Flavell made a special study of the school broadcasting systems operating in Western Samoa and Fiji. Here, assisted by children from various schools in Suva, a school broadcasts officer conducts a session over the Fiji radio station.

WHEN asked to write an account of my recent visit to other territories I found it a rather difficult task. Personal benefit is a hard thing to assess or explain. I am most hesitant to comment on the various aspects of education I observed in those places in case my remarks could be construed as criticisms. Nor do I wish to make or imply comparisons. Therefore I intend simply to give a factual account of my tour in the hope that it may be of some use to officers who are contemplating similar visits.

The visit was really the outcome of our Resident Commissioner's interest in broadcasting and his desire to get it started in Niue. While attending a South Pacific Commission session in Noumea he noticed a small sum had been set aside in the estimates to aid visits by educational officers to other territories so he immediately made application for a grant to send me to Samoa and Fiji to study their broadcasting services to schools.

When he mentioned it to me on his return I was extremely pleased, but I felt that there were other aspects of education which were a more immediate problem here. Our post primary school was only a year old and still growing, domestic science was just beginning, the appointment of a teacher trainer was about to be approved, and the erection of a manual training block was also proposed. I therefore suggested that the purpose of the visit be extended so that I could see how these things were working in the other islands. The whole scheme was then approved.

I left Niue on March 4 of last year and spent half a day at American Samoa, seventeen days in Western Samoa, four days in Fiji, and a few days in Tonga, arriving back in Niue on April 2.

In Pago Pago I was met by the Director of Education who took me through the High School and Teachers' Training College, and gave me an opportunity to meet the senior members of his staff.

The early part of my stay in Western Samoa was spent with the Schools Broadcasting Officer, Mr. Alan Gordon, most of it in the office, but part in various schools listening to the broadcasts and observing how the teachers and the pupils handled them. I prepared a fairly detailed report which included lists of staff and equipment and a step-by-step account of actual broadcast sessions. I also obtained copies of the booklets issued to their teachers to supplement the broadcasts, and several most helpful reports.

I next visited the Teachers' Training College, Samoa College, Avele Boys' Agricultural College, Apia Primary School, Vaipouli School (a boarding school for senior boys on Savai'i), the domestic science centre, woodwork centre, trades training centre, district schools and village schools.

In most cases I was looking for answers to particular problems. For example, I had been uncertain just how far we should go with the cookery side of our domestic science teaching, just how much we should "Europeanize" it, and consequently what sort of equipment we should use. As a result of my discussions with the domestic science teacher and others, and of my observation at the centre, I was able to return with a firm plan suitable for Niue.

Again, at the Training College I sought opinions on such things as the amount of theory that could and should be given to native students as compared with teaching simple lesson techniques; and whether it would be better to spend more time on special demonstration lessons at the college and less out on observation. And generally I was interested to see how far schemes were adapted to suit the native teachers and pupils.

And at every place I sought material —timetables, schemes, reports—and everywhere it was freely given. This, I felt, was the outstanding feature of my visit (apart from the generous hospitality).

In many cases I did not have to ask, but found waiting a carefully selected pile of material for me to take away. The woodwork teacher in Western Samoa, for example, gave me a complete set of models which have since proved most valuable to our Niuean instructor.

Brief Visit To Fiji

My stay in Fiji was much too short for me to get more than a look at the surface of things, but I was able to visit the schools broadcast office and the radio station, Nasinu Training College, a remote school (Vunidawa) and three of the colleges.

I found my itinerary had been carefully planned so that I should get the most out of my brief visit. For example, after spending a day at Nasinu I was taken fifty miles to Vunidawa school, the headmaster of which had previously

worked for two years in the schools broadcasting office. I was not only able to spend the evening obtaining his views on broadcasts and the reactions of native teachers and pupils to them, but also sat next day with his classes when the schools session came over the air. In addition, I had the opportunity of visiting three colleges on the return route and had the personal pleasure of seeing something of Fiji.

At Nukualofa, Tonga, where I unexpectedly called on the Director, I was received most hospitably and was able to spend an hour at the Training College before the ship sailed.

Finally, after returning to Niue, I compiled for the South Pacific Commission a report on my tour, with comment on its value to me in my work on Niue. This was duly forwarded along with a copy of my report on the Samoan school broadcasts.

A Valuable Tour

To me the trip was of inestimable benefit. I learned new ideas, I resolved many doubts and, what is most important, I was able to return with a feeling that in general, education was developing along sound lines in Niue, and thus we could push ahead with added confidence.

As far as broadcasting was concerned, I arrived at the opinion that it could be a valuable aid to our school and adult education programme, but that it was a venture not to be lightly undertaken and that we would have to face up to added costs and the need for additional staff if it were to be done effectively.

Apart from helping with specific problems, just meeting other directors and having general discussions with them was of tremendous value. Niue is an isolated place where there is little opportunity of sharing views on education matters. This has to be done mostly by letter which is of course far less satisfactory than personal contact, for reports, descriptions, and schemes cannot convey their full meaning unless they are read against a background of personal experience.

Officers similarly placed could not fail to benefit from such tours, and I would say most definitely that more of them should be sponsored. Also, I am sure that regular seminars would do much to promote greater educational progress throughout the Pacific.

In conclusion, I must express my thanks for the hospitable way in which I was received everywhere. It is perhaps invidious to mention names when everyone from the four directors to their senior officers and practising teachers assisted me in every possible way, but I feel I must mention Mr. Lambie, Director of Education, Western Samoa, and Mr. Bay, Chief Inspector of Schools, Fiji. Both these gentlemen gave me far more of their time than I feel I deserved, and I am extremely grateful to them. I must also thank the South Pacific Commission for sponsoring the tour, and the various governments who made it possible.

[EDITOR'S NOTE: Three further Commission-assisted tours by islands education officers have taken place this year, and three more have been approved.]

Coconut Varieties Of French Polynesia

(Continued from page 37)

which the spadix bears only two or three branches with male flowers. It would appear that the characteristics of such trees fall between those of the normal type of palm and of that which Brown describes as *Diplothemium* sp.

(f) HAARI OVATA UTE—UTE: Green nut variety. The area surrounding the stem insertion is red; used in local pharmacopoeia.

(g) LARGE SHELL PALMS: *Haarihue* (*hue* calabash).

(h) LARGE NUT PALMS: very thick husks.

(i) HORNED NUT PALMS: *Haari tara.*

(j) PALMS on which the leaflets do not separate.

*

The criteria used in this review were chosen arbitrarily, and the framework we have adopted is sufficiently loose to permit of the insertion of sub-types which taxonomists may eventually wish to classify as varieties. The exhaustive list of appropriate criteria is beyond the scope of this review, and may appear separately in another type of publication.

Fourth Pacific Conference In Retrospect

(Continued from page 34)

A word about the Conference site at Malaguna. It was probably the most attractive of the Conference venues so far: the modern buildings of a technical training centre that is doing much to equip youths of Papua and New Guinea for life as carpenters, mechanics and technicians. All the buildings—the dormitory and amenity blocks and the administrative headquarters—were erected by the students themselves as part of their training.

Here, the delegates were comfortably housed and catered for, and here, in lofty halls that normally are instructional workshops, they held their meetings and were provided with recreational facilities. The headmaster, Mr. George Harrington, his staff of instructors, and student volunteers did everything possible to ensure the comfort of delegates and others attending the Conference.

Malaguna in 1959 set the seal on the South Pacific Conference as a meeting of value. In his closing address the Chairman described the Conference as being in many respects the finest flower of the South Pacific Commission's achievements. None who was privileged to attend the sessions will dispute that belief, nor will he quarrel with Mr. Halligan's further belief that the Conference is doing a great work, which it will, and must, continue for the benefit of everyone in the South Pacific region.

Travelling Library For The Solomons

(Continued from page 39)

this manner. When filled with over 100 books each averaged 72 pounds—a weight easily handled by two men, and portable by one man for short distances.

By way of experiment the remaining two units were housed in marine plywood boxes with hinged lids instead of the steel ammunition cases. These two boxes also had double locks attached, and were slightly larger, measuring 24″ x 14″ x 10″. If these two stand wear and tear satisfactorily, the assembly of future travelling libraries will be simplified. However, the hinges, locks, and safe keeping of the keys, may prove weak points.

To ensure efficient running of the library, eight forms and two rubber stamps were devised. Two of the forms are reproduced with this article.

Another worthy of mention here is form M.L. 1—"Record of Readers of Book". This records the title of book, name of reader, sex, occupation, age, highest standard reached in school, degree of interest in book, whether considered easy or difficult to read, and any other brief comments.

Periodic collation and study of this record should give a valuable indication as to the books proving the most popular and useful. This information should be of special value to others setting up libraries elsewhere.

Details Of Expenditure

A statement of the expenditure to date of the library is given below:

B.S.I.P. MOBILE LIBRARY—STATEMENT OF EXPENDITURE

	£A.
2276 books	447
24 metal cases, including painting, etc.	57
24 wooden boxes—materials	47
Labour and painting	60
78 folios—supplies of 7 forms and labels	69
MISCELLANEOUS EQUIPMENT	
Rubber stamps; stamp pads; numbering machine; paper punch; spray gun and insecticides	11
Extra labour at 8/- per hour	14
Shipping costs; freight; handling; insurance, etc.	58
Estimate for printing questionnaire	5
	£A.768
Balance in credit to be used for maintenance, repairs, and replacements	482
	£A.1250

A questionnaire will be issued in due course to those operating and using the Solomon Islands library. The results of this should be of special value to officers in other territories contemplating a similar activity.

The Literature Bureau will be happy to supply any further information on the library, including a copy of the list of books finally chosen.

Members of the conch shell band of the Bumayong Lutheran School, near Lae, rehearsing.

Music Of New Guinea

Seventy-three excerpts of New Guinea music from fourteen geographic areas comprise the recording reviewed below by . . .

TREVOR A. JONES*

AT long last a small commercial recording company has taken a step which the larger companies (with the single exception of the two discs of Arnhem Land music collected by Professor A. P. Elkin) have failed to take: the making available of primitive and folk music to a wide range of people. There can be no doubt that public interest in non-European music—primitive and oriental—and folk music has grown considerably of recent years, and it is to be hoped that the commercial success deserved by this pioneering record will be achieved and so make further ventures in this field possible.

There are two classes of people concerned with the study of primitive music: those who go into the field, braving all discomforts, to record the music "on location", and those who painstakingly analyse and transcribe these recordings in civilized comfort. Sometimes these two occupations are ideally combined in the one investigator, but otherwise it is obvious that the latter depends entirely on the former for his material. It is strange, therefore, that while there is plenty of financial support for the home researcher, the intrepid collector usually labours under a severe lack of funds and time. Ray Sheridan's work in New Guinea, as is abundantly evident in this recording, is deserving of the highest praise and generous support. Perhaps this record may help to ensure the future success of his most valuable and devoted enterprise.

The music is arranged in a way that should make the record attractive to the layman. Nearly all the excerpts are very short, and consist of seventy-three examples representing fourteen geographic areas including the greater part of the Australian Trust Territory of New Guinea, adjacent islands such as Manus, and the Admiralty Islands, New Britain, New Ireland and the Solomon Islands. The excerpts follow one another rapidly and tastefully, and are grouped into areas separated by scrolls for easy identification.

The sub-title AN INTRODUCTION points to a possible limitation of this record. The rich variety and sheer number of excerpts offered certainly give one a very good introductory knowledge of the area as a whole, but the individual pieces are too short for the more serious student of such music to form definite conclusions. One longs for a relatively complete song-cycle or for an extended rhythmic display from the Manus Island drummers, for example, in order to analyse their methods of development and variation. This need has, needless to say, been realized by the writer of the excellent background notes on the record-sleeve. "It is hoped to produce further albums in this series that will deal with the music of some of these areas in more detail, and also with the music of the Australian colonial territory of Papua." It is in the interests

(Continued on page 56)

* Mr. Jones is lecturing in music and continuing research in ethno-musicology at the University of Sydney. He was co-author with Professor A. P. Elkin of the Oceania Monograph *Arnhem Land Music* published last year by the University.

Visitors to the Mount Hagen district are often entertained by these bearded New Guinea highlanders dancing and chanting to the beat of kudu drums.

The University of Queensland at St. Lucia, Brisbane, where the seminar will be held.

SPC To Hold Education Seminar For South Pacific

Last October the South Pacific Commission decided to convene this year a regional education seminar for the South Pacific. Its purpose is to give those responsible for the development of education in the region an opportunity of meeting together to discuss common problems, and of advising the Commission concerning specific activities it might undertake in association with territories to advance the general level of education within the area.

By RICHARD SEDDON*

IT has now been decided that the seminar will be held in the second half of November at Brisbane where, thanks to the generous co-operation of the University of Queensland, admirable facilities will be available in the University's magnificent new buildings at St. Lucia. Splendid residential accommodation is being made available for all participants at Emmanuel College, one of the University's residential colleges for men.

Although the total attendance will probably not exceed thirty, a number of different interests will be directly represented. Directors of education and senior education officers from most of the sixteen territories that together form the Commission's area of concern will comprise the heart of the seminar, the high level of which has been deliberately planned for these officers who are responsible for the effective carrying out of the educational policies of their administrations, and whose professional advice to administrations is a most influential factor in the development of educational policy and planning.

The six metropolitan governments within whose jurisdiction the sixteen territories lie have, of course, a close and continuing interest in educational progress within their territories, and have among their top-level educationists men with first-hand experience of education not only within the Pacific but also in other areas at comparable stages of development. Each of the six participating governments of the Commission has been invited to be represented at the level indicated.

In many parts of the Pacific, educational activity has for quite long periods been almost synonymous with mission activity, and the important rôle that missions have assumed and the important contributions they continue to make in many territories have been recognized by representative mission organizations in the area being invited to be represented by observers at the seminar.

*Executive Officer for Social Development, South Pacific Commission.

Seminar participants will be housed in Emmanuel College. First opened in 1956, it is one of the University's residential colleges for men.

When, to these three important interests, one adds a consultant in the field of language teaching from the United Nations Educational, Scientific and Cultural Organization, and officers of the South Pacific Commission itself, the picture of participation is complete.

There are, of course, a host of questions and problems that could be discussed by such a representative seminar, and one has no doubt that many of them will in fact be keenly discussed and debated during all the informal opportunities that a residential seminar is bound to provide. So far as the formal discussions are concerned, however, the Commission has reached the conclusion that the seminar should focus its attention on a carefully-selected number of inter-related problems in formal education which are of common interest and concern throughout the area. Among those listed for consideration are the provision of varying types and levels of education in relation to the professional and other occupational needs of a territory, the training of teachers, the place of an educational aids service, and methods of teaching languages.

In addition to giving participants this opportunity of meeting together for an exchange of views, both formal and otherwise, the Commission is anxious to have the advice of the seminar concerning the most effective rôle it can itself assume, in association with territories, in assisting further educational development within the region. To this end it is asking the seminar to recommend specific activities that it might undertake.

Preparations for the seminar are well advanced, and one cannot be other than enthusiastic about the way in which it is already shaping up. It is quite clear that the interest of territories is uniformly high, the response of the mission organizations extremely co-operative, the attitude of UNESCO helpful, and the consideration by metropolitan governments at the high level the Commission had in mind when authorizing the holding of the seminar.

There can be no doubt that this regional education seminar will constitute a most authoritative body of professional opinion based on a wealth of informed experience. Important as it will be in its own right for its consideration of the matters specifically referred to it, in the long run it may very well be of even more importance as the starting point of an influential Commission programme in the interests of educational development within the region.

Commission Appoints New Head For Economic Development Programme

Dr. Jacques Barrau, at present SPC plant introduction officer, has been appointed executive officer for economic development as from November next, when the present holder of the post, Dr. Alex Kroon, will retire after seven years of service with the Commission.

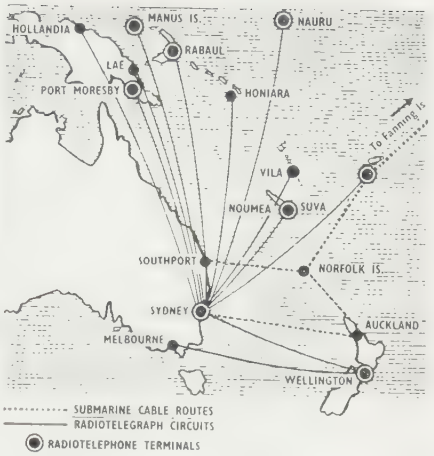
Dr. Barrau examines a kava plant (Piper methysticum) in the garden of the Bishop Museum, Honolulu.

This will be Dr. Barrau's fourth post with the Commission, which he joined in 1952 following five years as head of the Department of Agriculture of New Caledonia. He was first in charge of the SPC clearing house on current research in the field of plant and animal industry, and later specialist in native subsistence agriculture.

He spent four years surveying subsistence agriculture in all the Pacific islands in the Commission area. His reports included *Polynesian and Micronesian Subsistence Agriculture* and *Subsistence Agriculture in Melanesia*, which were published by the Bernice P. Bishop Museum of Honolulu. He was also co-author with Dr. Emile Massal, who was then in charge of the Commission's health programme, of *Food Plants of the South Sea Islands*, published in the Commission's Technical Paper series (No. 94).

In August 1956 Dr. Barrau left for France to study for his Doctorate of Science, which he took early in 1957. Soon after he returned to Commission service as plant introduction officer.

In this post Dr. Barrau has developed the Commission's plant introduction service so rapidly that planting material of well over one hundred species and varieties of economic plants has been distributed among territories in the past eighteen months.



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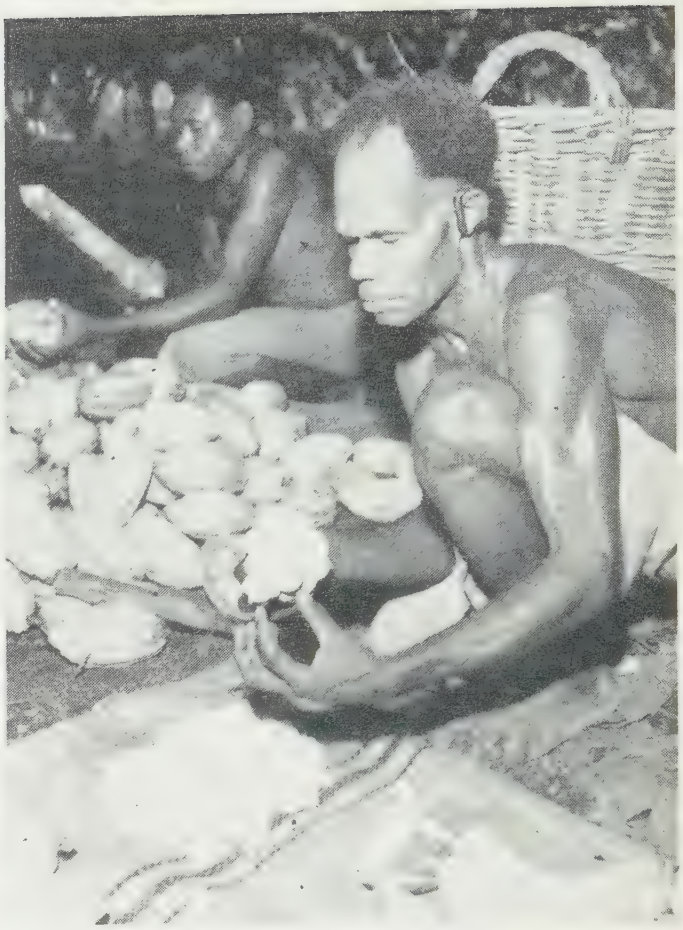

Above: An agricultural field worker at the Lowlands Agricultural Experiment Station, Kerevat, near Rabaul, hand-pollinating cacao flowers in one of the many test plots at the Station. Hand pollination in cacao breeding gives a known cross. Right: Breaking ripe cocoa pods at Kerevat. The pods are collected for breaking at central points in the cocoa stand, and the beans are then transported to the fermentary for fermenting and drying.

The Cocoa Industry In Papua And New Guinea

Cocoa In Papua And New Guinea is the title of a publication issued recently in Canberra by the Department of Territories. It comprises two parts, one an economic study of the industry, the other an assessment of its long-term prospects. This publication will be of special interest to planters in those South Pacific territories where today cocoa is rapidly becoming a crop of major economic importance. It is reviewed below by . . .

V. D. STACE*

THIS handbook on cocoa production in Papua and New Guinea has been published by the Department of Territories, Canberra, to provide factual information for planters, officials and others concerned with the industry.

While fulfilling this purpose impressively, it also provides a rich store of general information on the territory's cocoa production and prospects, including an unadorned but vivid account of the quite spectacular growth of the industry in the past ten years. From little more than 100 tons for the year 1947-48, cocoa exports from Papua and New Guinea have increased dramatically each review period, reaching 2,577 tons in 1957-58. Official estimates quoted in the handbook anticipate even greater rates of increase in the future, with exports increasing to 12,000 tons in 1961-62 when, without serious rival, Papua-New Guinea will be the leading cocoa-producing territory in the South Pacific.

These estimates are based on plantation development that has already occurred. If the industry continues to attract new enterprise at anything approaching the rate of recent years, production totals in excess of 20,000 tons a year may be anticipated in the near future, giving Papua and New Guinea a major industry of international importance.

The handbook comprises two separate surveys of a complementary nature. The first, entitled *An Economic Study Of The Cocoa Growing Industry In Papua And New Guinea*, was prepared primarily by Mr. D. D. Shaw of the Bureau of Agricultural Economics, who was engaged to determine and report upon the average cost of establishing plantations and producing cocoa in the territory.

Most of the early chapters deal with the field experience and financial transactions of 49 representative plantations under European ownership and management. Of these, 25 are in New Britain, the principal production locality, the remainder being in Madang (6), Bougainville (6), Morobe (5), Papua (4) and New Ireland (3), thus giving a proportionately representative sample.

* Mr. Stace, who is Assistant Economist to the Reserve Bank of New Zealand, has carried out for the Commission several economic surveys in the South Pacific

As at June 1957 nearly one-third of the total number of cocoa trees in Papua and New Guinea were native-owned, growing principally in the plantations of the Tolai people of the Gazelle Peninsula of New Britain. The recent expansion of cocoa production on native smallholdings parallels the achievements on European plantations, and the survey anticipates that in the future the proportion that native-produced cocoa bears to total production "will at least be maintained".

In 1940 it was estimated that there were 2,582 acres planted in cocoa on European-owned plantations, which compares with the latest published estimate of 45,559 acres as at March 1957. After the devastation of World War II there was a period of gradual rehabilitation of damaged and neglected plantations. Thereafter attractive cocoa prices on world markets and a flow of finance from profitable copra production encouraged other planters in Papua and New Guinea to interplant their coconuts with cocoa. At the same time a steadily increasing number of sole cocoa plantations was also being established.

Contrary to the sole crop specialisation followed in most other countries, it has become general in Papua and New Guinea to interplant mature coconut areas with cocoa where natural conditions are suitable. Soils of recent volcanic origin are favoured, but alluvial soils often give good results in these territories provided drainage is adequate.

The provision of additional shade trees for the cocoa is not usually required when interplanting unless the canopy of coconut fronds is sparse and there are long periods of direct sunshine. Then the provision of suitable shade trees such as *Leucaena glauca* is found necessary for satisfactory results.

Costs Of Development

The tables and commentary in the survey emphasise the extent to which the expansion of cocoa plantings during the past few years has been made possible by profitable copra prices. The financing of sole cocoa plantations by European planters has been more difficult, and until recently this type of development tended to lag behind interplanting.

In an income and expenditure analysis of 21 plantations, where net plantation income totalled £A.257,000, no less than £A.43,000 was spent on plantation development, principally cocoa, and £A.104,000 invested in structures and machinery. In addition to this local investment from copra profits the marked premiums in the market values of plantations over their cost of establishment and the frequent inquiries made concerning investment opportunities in cocoa production from Australia and from overseas provided evidence of the availability of outside capital to finance this development on a commercial basis. As yet there has been little demand for bank credit for this purpose, but the demand may grow as increasing numbers of sole cocoa plantations require temporary finance.

When an official survey was made in 1956, just under half the European plantations then producing cocoa had more than 100 acres in this crop, while 16 per cent exceeded 300 acres. Mr. Shaw's report concludes that new planters should aim at developing from 200 to 300 acres of sole cocoa for optimum results,[1] notwithstanding the fact that the initial establishment presents a formidable task in finance, organisation and effort. It is pointed out that in Papua and New Guinea the cost of acquiring uncleared leasehold land is of little significance, the booklet quoting as examples expenditure of 5/- per acre in the Popondetta district and, in the higher bracket, £1 per acre net cost in the lower Markham Valley.

On recent experience the initial clearing,[2] planting and early maintenance of 200 acres in sole cocoa with adequate shade trees requires an investment of £A15,000 to £A20,000, while a further £A13,000 (approx.) is required for a residence, plantation buildings, machinery, etc. Overall development costs for 200 acres of cocoa brought to five-year maturity—when payable cropping begins—were estimated to require a total investment of £A36,200, or £A181 per acre, including allowance for interest on capital and owner-managerial expenses at £A1,500 per year.

The net cash requirement, i.e., investment cost less profits re-invested from cocoa trees bearing after three years, could be some £A4,000 less, or £A32,200 in total.

In view of these heavy initial expenditures it is not surprising that Mr. Shaw was impressed with the dearth of younger men who, as individuals, were developing cocoa plantations. (A footnote in the booklet draws attention to a scheme recently announced by the Minister for Territories which will enable credit to be made available to ex-servicemen settlers in Papua and New Guinea who are occupying agricultural land or who obtain such holdings. Including allowances for interest on capital and managerial expenses, the overall costs of establishing interplanted cocoa were found to average £A110/16/- per acre without additional shade, and £A125/10/- per acre with additional shade.)

Production Costs

On interplanted plantations, average production costs per ton of dry cocoa were £A116/11/3 in the sample of 20 units surveyed, which included labour costs of £A50/8/- per ton. These compared with a total average cost of £A40/9/2 per ton for copra on the same plantations, of which labour costs were £A15/9/10 per ton.

In the survey the examples given for sole cocoa plantations showed a very wide difference in costs of establishment according to methods used in clearing and in the provision and control of shade. Felling and rough clearing of jungle, with partial grubbing of stumps, required capital expenditure of £A95 per acre for development and early maintenance to five-year maturity. Clean clearing increased these costs to £A171 per acre and mechanical clean clearing—which, in practice, resulted in damage to surface soils—was only slightly less costly at £A167 per acre.

The investigation showed that shade

[1] At the usual density of about 220 trees per acre a 300-acre unit would accommodate a total of 66,000 trees in sole cocoa.

[2] Felling and rough clearing only with partial removal of stumps.

Cleaning cocoa beans on the drying trays at Volavalo Cocoa Fermentary in the Rabaul district. The output of this fermentary exceeds 100 tons of dry cocoa beans a year, produced by 423 individual growers living within a four-miles radius of the fermentary.

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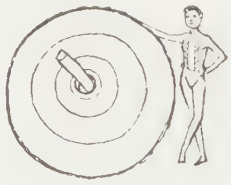
Feather money — from Santa Cruz, this form of currency was a necessary part of a bridal dowry.

Flying fox jaws — used for ornamental or trading purposes by Fijian natives.

Whale's tooth — Fijian natives wore these as pendants until needed for trading.



Stone money — used in the Caroline Islands, often larger than 10 or 12 feet in diameter.

Left: Head money — flying fox fur string wound round a wood[en] [fra]me was an early form of currency in the New Caledonia

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control was probably the most important single factor influencing costs of establishing cocoa and in reducing grass-cutting costs.

Native Cocoa Production

The handbook also gives details of recent activities of the Administration in Papua and New Guinea in promoting cocoa-growing among the native peoples as a suitable cash crop to supplement their traditional subsistence agriculture. As a matter of policy all such plantings are registered and regularly inspected for disease and insect pests.

So far the response has been greatest among the Tolai people of New Britain, but interest in cocoa-growing is now widespread and gaining momentum. At June 1957, 2,329,000 native-owned cocoa trees were recorded, of which some two millions were in New Britain. Most are small-scale plantings with 80 to 90 per cent containing fewer than 1,000 trees. Very rapid development has occurred in spite of uncertainties of tenure and the complexities of group ownership affecting the native lands concerned.

In the early post-war years it was generally considered that New Guinea's native-produced cocoa could be satisfactorily fermented and dried in small individual lots by primitive techniques. However, in view of the great advantages in establishing and maintaining uniformly high standards for all types of cocoa from Papua and New Guinea, prompt steps were taken by the Administration to ensure efficiency in the processing and marketing of the native-grown product. Hence the development of the Tolai project; a pioneering venture of special interest and significance.

The Tolai Project

The Tolai project consists of a number of central fermentaries for the processing of cocoa produced by native growers in the Gazelle Peninsula of New Britain. It began more or less experimentally some six years ago when, operating through the local government councils concerned, fermentaries were established at Ngatur and Pelegir in temporary buildings of native materials.

These "pilot" ventures served to establish methods of handling, recording and processing the wet beans delivered by the growers. They also emphasised the advantage of providing more suitable and permanent equipment and the need for a rapid expansion of these facilities to cope with increasing production in prospect.

To assist this expansion, loans totalling £A6,310 were granted to four local government councils during 1953-54 for buildings and equipment. The growers themselves provided loans of £A9,816, mainly from undistributed proceeds of cocoa, as well as free labour to build new fermentaries at focal points in the main producing areas. In 1955, rapidly-mounting production trends made it obvious that some longer term planning

was necessary, and it was concluded that development loans totalling £A80,000 should be made to five native local government councils to equip 14 fermentaries. These loans, which were provided by the Bank of New South Wales, were guaranteed by the Administration.

In his survey of the Tolai project, Mr. Shaw paid tribute to the way in which the Tolai growers have contributed to establishment of the present sound financial structure of the project during the development period. As at the end of June 1957 the loans from the Bank of New South Wales had been reduced by over £A29,000 to £A50,921 and all other capital borrowing had been repaid. At that time it was estimated that additional working capital of £A25,000 would be needed to finance wet bean advances and bulk purchases of sacks, and a further £A31,200 would be required to finance 1957-58 expansion programmes.

In a detailed analysis of processing costs for the 18-month period ending September 1957 it was shown that total fermentary costs were £A48/2/4 per ton of dry cocoa, including depreciation and interest costs. Central administration costs averaged £A17/0/11, but up to that stage in the development of the project only part of these administration costs were brought to charge. The salaries and allowances of the European staff of three, the general manager, the field manager and the accountant, were provided by the territory Administration, which also furnished office accommodation. As production increased and economies of scale reduced unit costs it was intended to pass over to the project all costs of central administration.

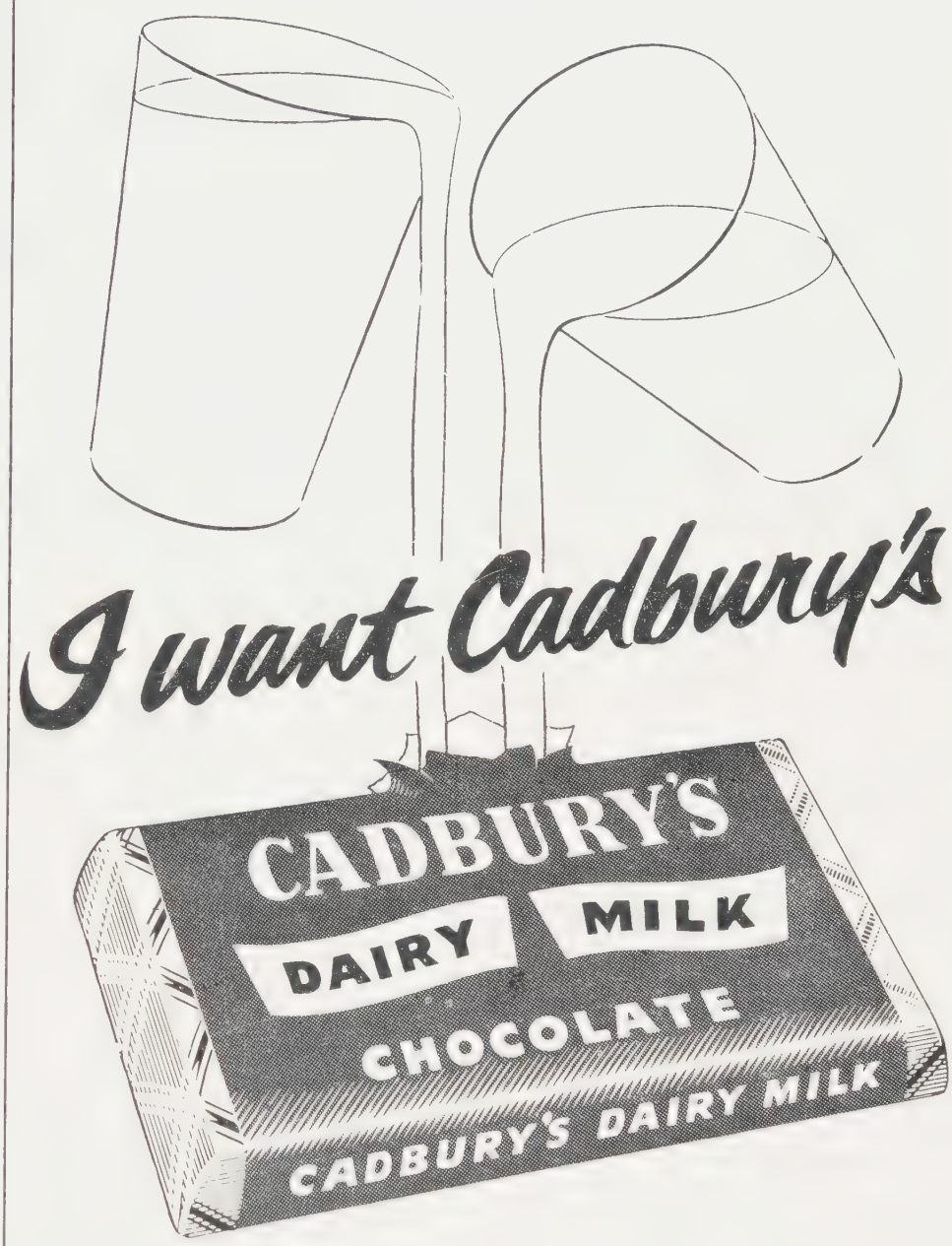
At present there are some 3,000 Tolai suppliers of wet cocoa beans. The local administration of the fermentaries is in the hands of native managers and clerical assistants under the supervision of the European field manager. The total production of dry cocoa in the fermentaries in 1956-57 was 581 tons, while it was estimated that the output for 1958-59 would exceed 1,168 tons.

The progress achieved has attracted much attention, and Mr. Shaw mentions that some of the European planters in the Gazelle Peninsula have seen advantages in developing co-operative fermentaries for their own use as an alternative to incurring considerable capital costs for individual installations.

Long-Term Prospects For The Industry

Part II of the booklet comprises a report on the long-term economic prospects for the cocoa industry in Papua and New Guinea. This report was prepared by the Commerce Branch of the Department of Territories, Canberra, under the Officer-in-Charge of that Branch, Mr. I. Cartledge.

The findings and conclusions of this survey are of much interest to the general reader as well as to cocoa producers in the South Pacific. Of the conclusions,



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probably the most impressive is the survey's support in 1958 of the view expressed in 1955 by Dr. Albert Vinton of the Food and Agriculture Organization, who wrote: "The economic outlook for cocoa appears to be highly favourable—perhaps more so than for any other agricultural products."[3]

Music Of New Guinea

(Continued from page 49)

of all concerned with music as a living, universal art that this project should be realized.

An informative leaflet describing each piece is included, and contains in addition some details of the many remarkable instruments recorded (bamboo trumpets and flutes, panpipes, drums of various types, zithers, jews harp and others). Like the Africans, but unlike the Australian aborigines, the New Guinea natives possess an extraordinary range of all types of instruments, using them sometimes in a very simple, even crude fashion to delight in their sheer novelty of sound, and at other times with quite highly-developed technical skill.

They have a remarkable ability for extracting beautiful sounds out of any raw material that comes their way; as for instance the *sake-e* singing tops of the Kainantu area, made from pierced tree seeds and thrown so as to spin on the ground to emit tiny siren-like sounds of the utmost delicacy (and incidentally to act as "pieces" in a gambling game at the same time!). Equally simple are the *launut* blocks of wood from Kavieng, which are hollowed and rubbed with the hand to produce notes of various pitches.

The styles of singing in the different areas vary almost as much as the types of instruments, from the delicate solo falsetto of the Warabut spells (Tolai Clan, Rabaul) to the full-blooded choral effects of Tasman Island, whose reedy, piercing tones and astringently beautiful harmonies may remind one unexpectedly of some Bulgarian peasant singing. Several burial and mourning songs are included, and provide interesting opportunities for comparison between widely separated districts.

The quality of the original tapes is consistently good, and the transfer to disc has been carried out with skill and intelligence, the result being a record of high sound quality. Undoubtedly it will be a necessary acquisition for all libraries of such music, and it should appeal to everyone who has a taste, however untutored, for the unusual in music.

MUSIC OF NEW GUINEA: AN INTRODUCTION. Sheridan and Smythe collections, edited by Ray Sheridan. (Released by Wattle Recordings, Archive Series, No. 2).

[3] From "Economic Aspects of Cocoa Consumption", *FAO Monthly Bulletin of Agricultural Economics and Statistics*, Vol. IV, No. 5, May 1955.

Modern pesticides marketed by reputable manufacturers are perfectly safe to use, provided they are used for their designed purpose and that the recommended safety precautions are observed. On the other hand, carelessness in the use of some preparations can result in serious illness, even death.

Beware Of Pesticide Poisoning

Carelessly used, some pesticides can be as dangerous to the user as to the pests they were developed to eliminate. For this reason, manufacturers' instructions for safety precautions should always be strictly followed.

By T. C. LONIE*

SPRAYS and applications used against pests of all sorts are nowadays compounded of new and complex chemicals, and their use often reveals that they are dangerous not alone to the pests which call for their use, but that they may also be dangerous to the user if he is not protected from them.

The trouble is that, as with radiation hazards and atom bomb fall-out, the danger is not immediately evident, nor does it seem to be related to its cause. Even a young child quickly learns to avoid sharp articles or burns, but a man may be careless of pesticides or insecticides because he sees no immediate effects from handling them, and does not realize that the illness to which he may fall a victim, perhaps long after he has ceased using the offending article, is due to the earlier exposure.

SPC And WHO Publications

In June last the South Pacific Commission issued a Technical Information Circular on pesticide poisoning in man. The Commission was not alone in thinking this important, for in the following month, the Division of Environmental Sanitation of the World Health Organization issued the first of a series of Information Circulars on the same subject (*Information Circular on the Toxicity of Pesticides to Man*, No. 1, July 1958).

The second of the series was issued in January 1959, and summarizes further publications in this field. It includes a long "Abstract of Report on the Toxicity of Dieldrin to Man", by Wilfred J. Hayes Jnr. as WHO Consultant. Dr. Hayes is an American authority of great repute in relation to work on pesticides in general.

It is hoped that these WHO circulars will be given wide circulation and close attention by all users of these valuable though sometimes dangerous preparations, and especially by agricultural users.

Directions Should Always Be Observed

Reputable manufacturers issue precise directions as to the proper use of their products, and these should be meticulously observed. After all, they have often spent many thousands of pounds in developing and studying their product, and are as well aware of its hazards, if any, to the user as of its effectiveness against pests. It is clearly not in their interests to market an unnecessarily dangerous material. For the same reason it is important for users to be wary of any product which appears to be too casually sold without adequate instructions as to its use, and to not have regard to price alone.

It is, however, misuse of these products which is the trouble in many instances. The worker who thinks the recommended protection too much trouble, and the employer who permits carelessness, have only themselves to thank if they meet with difficulty.

Dieldrin is commonly used as an anti-mosquito spray. Absorbed from the skin, it produces definite poisoning, which may include convulsions, and may involve a long illness. But washing with soap and water, and simple protection of exposed

(Continued on page 65)

* Public Health Officer, South Pacific Commission.

CONFERENCE RESOLUTIONS

Thirty-three resolutions were passed by the fourth South Pacific Conference. These were considered at a special session of the South Pacific Commission, held for the purpose immediately following the Conference. The full texts of both Conference resolutions and Commission recommendations regarding them appear in the PROCEEDINGS OF THE NINETEENTH SESSION, *which may be obtained from the South Pacific Commission, Box 5254, G.P.O., Sydney, Australia, price 2/- stg., post free by surface mail.*

Rabaul Conference An Outstanding Success

(Continued from page 22)

so that emergence from an older and more primitive way of life may be coincidental with the development of the new and better order."

Thirty-three resolutions were adopted on the final day of the Conference, May 13. Most of them had come to the Conference in the form of draft resolutions from the two standing committees, and they were incorporated in the report of the Conference to the South Pacific Commission.

They were presented to the nineteenth session of the South Pacific Commission which opened the following morning to receive, consider and act on them.

Subjects For Next Conference

An interesting sidelight of the Conference was the wide range of subjects that delegates brought forward for inclusion in the agenda for the fifth Conference. At previous Conferences the agenda subjects suggested were relatively few. On this occasion more than forty were made. Some of them were closely related to others, or could be joined with them, and a special drafting committee reduced them to twenty-five.

The suggestions included such matters as the training of islanders in business methods and practices, problems of inter-island transport systems, the promotion of inter-territorial trade as a necessary step towards more effective participation in world trade, the changing role of women in South Pacific territories, the role of witchcraft in the life of the islanders, the place and development of the press in the South Pacific, the importance of organized adult education schemes in South Pacific territories, and the importance of relating agricultural and technical education to the needs of each territory.

These were among the proposals that will come before the South Pacific Commission when the agenda for the fifth Conference is being decided.[2]

It is possible that the Conference will next meet in Pago Pago, American Samoa. An invitation to hold it there came to the fourth Conference from the Governor of American Samoa through the delegation from that territory. (A further invitation—to hold the sixth Conference in Netherlands New Guinea—was conveyed by the delegates from that territory.)

Local Visits Arranged For Delegates

A highly successful feature of the Conference was the series of visits arranged to enable delegates to see what was being done for the New Guinea people in the Rabaul district.

They inspected cocoa fermentaries cooperatively owned by New Guinea villagers and visited the Keravat agricultural experiment station, where extensive research into crop improvement and control of pests and diseases is being carried out. Delegates also visited native local government councils and inspected some fine schools, hospitals, and mission stations.

On the entertainment side, indigenous feasts and dances were staged, including a Bainings fire dance, which is a ceremony rarely performed for visitors. Native local government councils entertained visitors at a dance followed by a feast, where an abundance of local foods cooked in earth ovens was laid out on mats and banana leaves for the enjoyment of delegates.

Of deep interest to all attending the Conference was the indigenous arts and crafts exhibition, comprising displays specially sent from most islands of the Pacific.

SPC QUARTERLY BULLETIN— AN APPRECIATION

Appreciation of the Commission's official magazine, the SPC QUARTERLY BULLETIN, *was expressed by the fourth South Pacific Conference in this resolution:*

> The Conference notes that in the Secretary-General's report, only passing reference is made to the *SPC Quarterly Bulletin*. The Conference wishes to place on record its appreciation of this excellent publication and its thanks to the Editor and all those who contribute the many informative articles which appear in it.

At its session immediately following the Conference, the Commission recorded its pleasure in the Conference commendation, and directed that its resolution be published in the BULLETIN *to inform contributors of it. The Commission added that it believed the publication of the* QUARTERLY BULLETIN *was one of the most important services it rendered to territories as well as to metropolitan countries. It was attempting further to improve the content and format, and to ensure wider distribution of the magazine.*

Conference Closed On May 13

The Conference, an enriching experience for all who took part, closed on Wednesday, May 13, with many expressions of thanks for and appreciation of the hospitality of the Australian Government, and the work of the Papua and New Guinea Administration in the excellent arrangements it had made for the meeting.

Recordings Of Pacific Islands Music

THE following eight recordings of Pacific islands songs are available from the South Pacific Commission:

SOLOMON ISLANDS

SOLOMON DAKEI AND HIS SOLOMON ISLANDERS (two pidgin English songs and two Roviana songs).
PRS 55, 7″ 45 r.p.m. EP A14/-

WESTERN BOYS' STRING BAND (two Roviana love songs).
PR 2791, 10″ 78 r.p.m. A10/-

GROUP OF SOLOMON ISLANDS SONGS (two songs by people of Sasavale village and four songs by girls of Bunana Melanesian Mission School).
PRX 4048, 12″ 78 r.p.m. A12/-

SIMBO ISLAND BAMBOO BAND (two songs).
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[1] The texts of the introductory papers presented at the Conference, and a summary of the discussions on them, appear in the REPORT ON THE FOURTH SOUTH PACIFIC CONFERENCE by the Secretary-General of the South Pacific Commission, to be published shortly. Copies will be obtainable from Box 5254 G.P.O., Sydney, Australia, price 2/- stg., post free by surface mail.

[2] A full list appears in the above Report.

Copra Processing In Rural Industries

Two new studies on the manufacture of copra were received recently by the Commission's library. One, with the above title, was published in Rome by the Food and Agriculture Organization; the other, entitled COPRA DRIERS, *was issued by the Department of Agriculture, Fiji. Both are reviewed below . . .*

By D. R. A. EDEN*

The Smallholder's Kiln, a small Ceylon-type drier which the authors claim produces high-quality copra in half the usual time.

IN *Copra Processing in Rural Industries,* the authors have described in simple terms the technology of copra processing. Descriptions, drawings and photographs of equipment which may be locally constructed in almost any copra processing area have been included, together with details of more advanced types of kilns and mechanical driers especially manufactured for the industry.

Copra Processing in Rural Industries is initially directed to furnishing information on copra processing, but the scope of the work is so general that the publication can be regarded as a short textbook on the coconut and copra industry.

In the Foreword the authors state: "These papers are intended for leaders responsible for guiding the development of agriculture and simultaneously agricultural rural industrialization and those who are responsible for the immediate supervision of copra processing industries and the training of workers in those industries.

"It is hoped that the many details given will stimulate and encourage rural leaders to recognise that, with some imagination, existing local processing techniques can be improved quickly, although a definite improvement plan will, without doubt, need time and hard work."

Throughout the industry today two factors have emerged which together have created a desire among primitive people to improve their standard of copra production. The first is the impact of penalties and premiums established for various grades of copra by marketing boards, and the second is the example set on post-war plantations by the introduction of modern processing methods which gain for the estates the highest prices possible.

High Prices Have Stimulated Interest In Kiln Drying

Exceptionally high prices for copra during the past decade have been responsible for stimulating interest in kiln drying. If favourable prices continue, it is not unlikely that this generation of planters may witness the passing of all low grades of smoke-dried copra.

Writing on this subject, the authors state: "When copra prices were low, in particular for so-called mixed copra, the interest in kiln-drying methods decreased, but when greater prosperity was proved by the use of the new processing techniques, more kiln-drying equipment came into operation. . . . However, improvement in quality is only attractive if the superior quality commands higher prices proportionate to higher processing costs."

Among the marketing boards the necessity for paying premium price for superior quality is fully recognised, and a number have imposed internal differentials to encourage the production of better-quality copra and to penalise the inefficient producer.

The foregoing factors have combined to promote considerable interest in modern processing methods for copra production, and this is by no means confined to company plantations and the larger private estates. Smallholders and native co-operatives have become interested in choosing kilns which are efficient in operation but which can be constructed of local materials or those which may be imported at moderate cost.

Smallholders Important Producers

About the smallholders the authors write: "When it is realized that over 90 per cent. of the world's copra is produced by smallholders, the need for small, simple and inexpensive copra driers is obvious. . . .

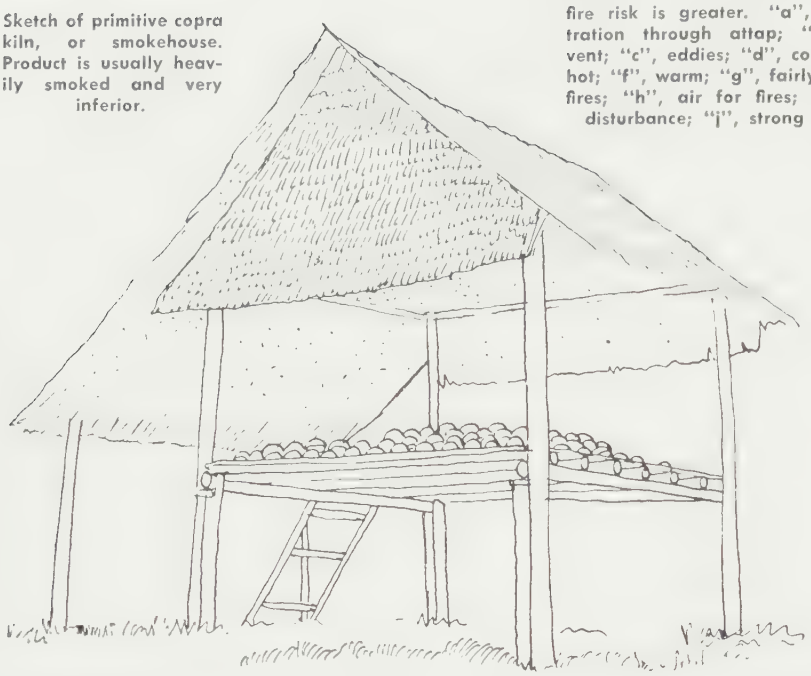
"The smallholder is an individualist who prefers to work how and when he likes and who does not worry about the future. It is for this reason that the individual small kiln will often have preference over the large central copra co-operative which will sometimes lapse into indebtedness and bankruptcy owing to erratic support. . . .

"Thus, the most that can be done to improve the processing of copra in rural areas where the standard is low is to recommend a simple and effective type of kiln and even advance loans for its construction and then do everything possible to improve the standard of processing by organized instruction and demonstration. . . ."

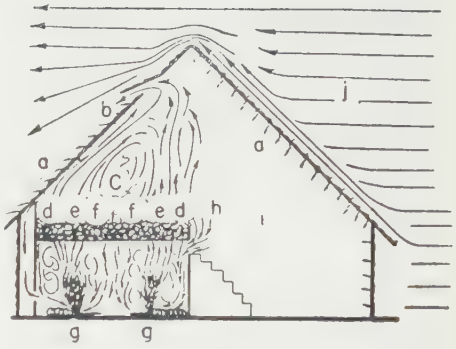
Under the section entitled "Review of

*General Manager, Government Trade Scheme, British Solomon Islands. Mr. Eden, who for many years was General Manager of the New Zealand Reparations Estates in Western Samoa, is a leading Pacific authority on coconut and cocoa cultivation.

Sketch of primitive copra kiln, or smokehouse. Product is usually heavily smoked and very inferior.



Closed smoke kiln. Using thatch instead of iron for roof gives better hot air circulation, though fire risk is greater. "a", air filtration through attap; "b", air vent; "c", eddies; "d", cold; "e", hot; "f", warm; "g", fairly steady fires; "h", air for fires; "i", no disturbance; "j", strong wind.



Processing methods and Equipment" the reader is taken step by step through the whole gamut of dehydrators, ranging from sun-drying platforms and ball copra to the smoke houses and hot-air kilns, both simple and complex. All these are described as simply as possible and drawings and photographs illustrate the driers in section and ground plan with views of completed exteriors. A number of the illustrations are reproduced here.

The authors point out that in the primitive smoke house illustrated the processing is more adequate when only coconut shells are fired, fitted into each other in parallel rows, using dry shells for preference.

Standard Ceylon Kiln

Firing with good dry shells plucked of adherent husk fibres is the main principle of the standard Ceylon kiln which the paper describes in some detail. (See sectional sketch.)

The kiln illustrated has a total capacity of 10,000 nuts, allowing a daily intake of 2,500 nuts. Smaller kilns to suit individual needs can be built on the same principle.

This Ceylon type drier was featured in W. V. D. Pieris' SPC Technical Paper No. 82—*The Manufacture of Copra in the Pacific Islands.* Both Pieris and the authors of the FAO publication refer to the importance of pre-drying the nut halves on a barbecue before they are placed in a Ceylon drier. The latter state: "The barbecue, which is a sloping platform made of bricks with a cement paving used for sun-drying the split nuts before kiln-drying, is also important. The use of such a barbecue greatly improves the processed copra. . . ."

The reader's attention is then directed to "The Smallholder's Kiln". This has been primarily designed for use in smallholdings of 8 hectares or under. An illustration of this kiln, showing that it has been constructed almost entirely from local materials, is reproduced here.

"This newly-presented kiln", the authors say, "is a Ceylon type drier, but is reduced in size and improved in design with superior operation, producing a better-quality copra in half the normal time, e.g., 2½ days, but without forcing the drying processing in any way."

A charcoal-fired oven drier is next dismissed rather briefly, but the reader is referred to a later chapter, "Coconut Shell Charcoal." This rather abrupt dismissal of an interesting drier is possibly because the charcoal firing is the only essential difference between this and the Ceylon types—standard and smallholder—which burn the half shells in green form for their heat supply.

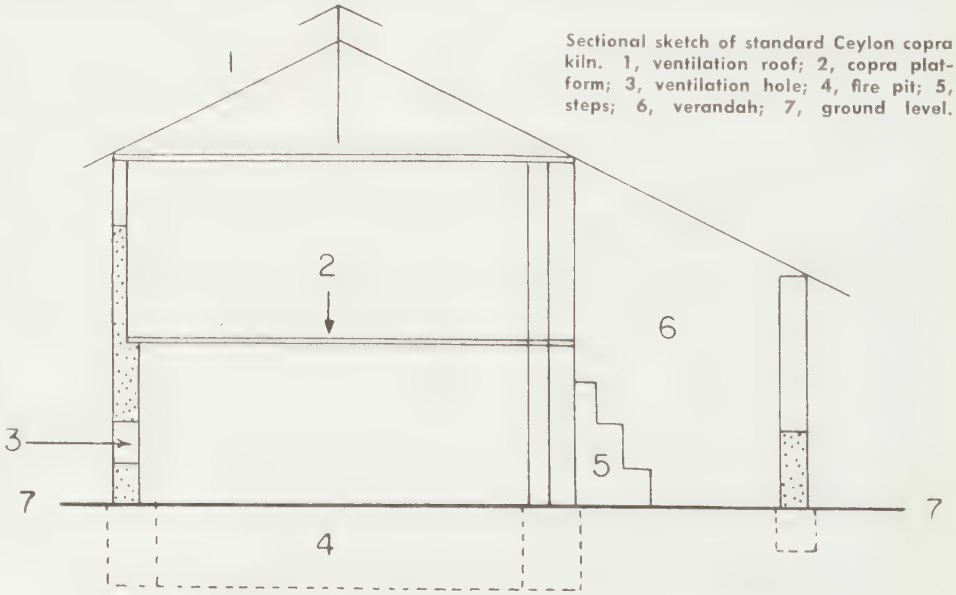
Turning then to the drying process in direct kilns, the authors have written an interesting chapter on heat convection cycles within driers, and convectional disturbances caused by outside conditions, an understanding of which is essential to those responsible for the supervision of copra-processing industries.

In a summary of this chapter we are told that the advantages of a thatched roof as opposed to iron are that it reduces convection cycles, diffusing air uniformly through the thatch, and on cold nights the influence of external conditions is not too considerable. On the other hand a closed iron-roofed kiln will prove satisfactory in sunshine, but less efficient at night.

Indirect Driers

Under the heading, "Indirect Driers", illustrations of a number of hot-air dehydrators with indirect heating are given. These are of complex design. They are almost invariably constructed of imported materials, and, being expensive to erect, are generally beyond the financial scope of the smallholder. The copra

Sectional sketch of standard Ceylon copra kiln. 1, ventilation roof; 2, copra platform; 3, ventilation hole; 4, fire pit; 5, steps; 6, verandah; 7, ground level.



driers used on plantations in Samoa and the New College copra drier reproduced here are typical examples of this class of dehydrator.

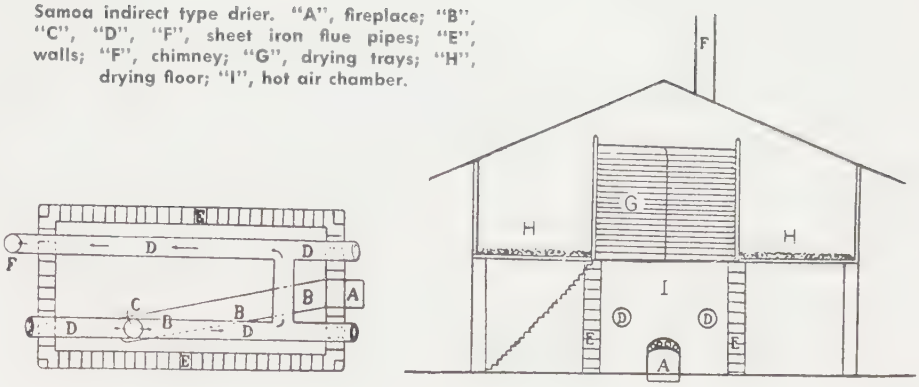
Finally the reader is introduced to a number of indirect continuous driers, which are generally mechanical forced-draught dehydrators, usually produced by engineering firms especially for the copra industry.

They are employed principally on large company-owned plantations, but have been considered for village co-operative work. However, one of these has been designed for the smallholder. It is called the "Perfect 50". Its makers claim that it can produce 50 tons of copra a year for 50 weeks, operating 5 days a week. "Under any weather conditions", they say, "clean, well-dried copra with a low fatty acid content is produced". Water tanks inside this drier help to keep the temperature even throughout the drying period.

As an example of the many useful items of information to be found throughout this paper, Table 6—Relations Between Temperature And Conflagration Of Kilns—is reproduced here. This gives observations from research on what happens to copra and materials usually associated with the interior of copra kilns at rising temperatures. For instance, it may be seen that at 185° C., mixed inflammable gases are given off by copra shell, while at 220° C., oily string and husk glow, and may ignite spontaneously.

A careful study of the figures given will give kiln supervisors a good idea of the dangers of high temperatures within a drier, promoted usually by careless and over-heavy stoking of the fires. A fire-gutted drier is, unfortunately, an all-too-common sight upon coconut plantations.

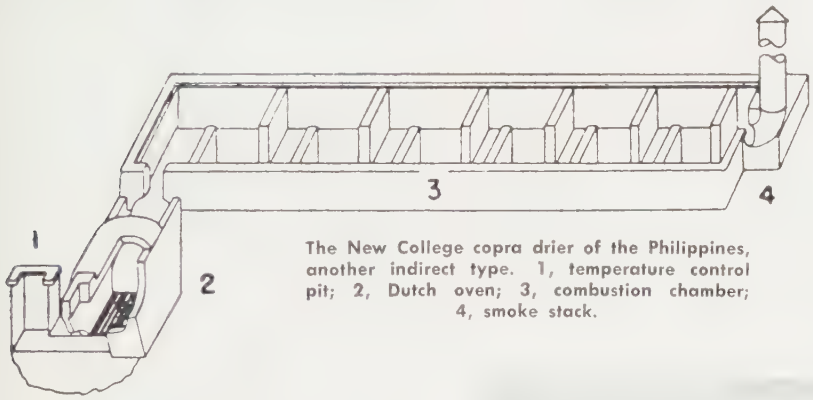
Samoa indirect type drier. "A", fireplace; "B", "C", "D", "F", sheet iron flue pipes; "E", walls; "F", chimney; "G", drying trays; "H", drying floor; "I", hot air chamber.



Most planters will agree that these conflagrations often occur in the small hours of the morning after drier attendants have stoked up a roaring blaze. They then go off to sleep in the hope that the "big fella fire" will be all that is required of them before morning.

In conclusion, the authors have this to say: "The foregoing consideration of rural industrialization based on the full use of products derived from the coconut tree by no means exhausts all possible aspects of the matter. . . . It is to be hoped that a great deal more research will be carried out on these questions as further developments will greatly benefit the rural societies which depend on the coconut for a living".

COPRA PROCESSING IN RURAL INDUSTRIES. By A. Aten, M. Manni, F. C. Cooke. FAO Agricultural Development Paper No. 63. Rome 1958. Price $1.50 or 7/6 stg.

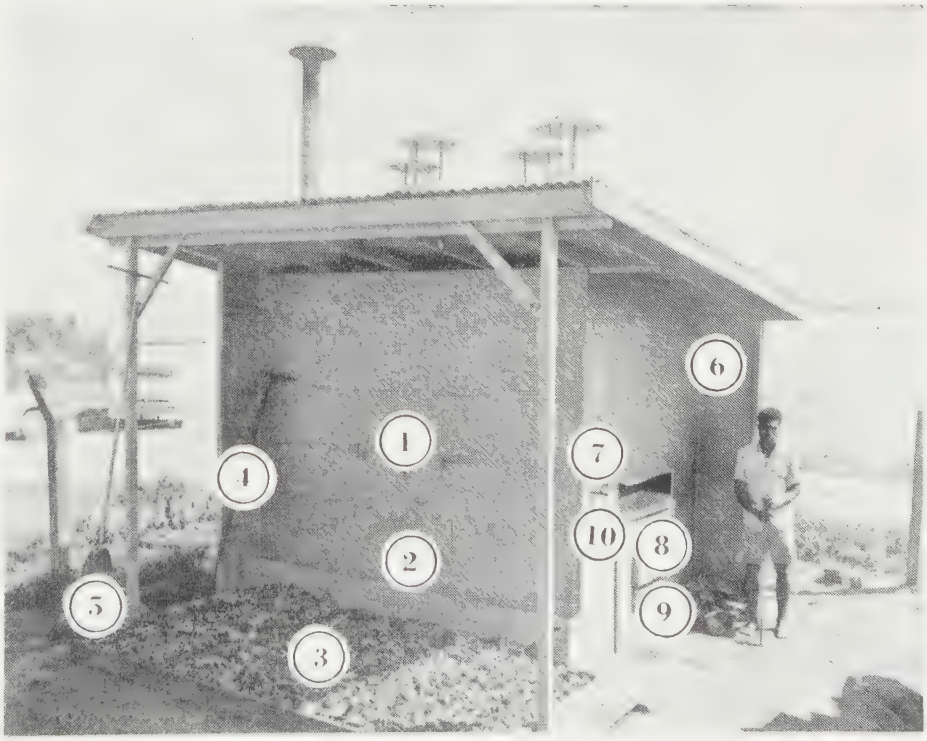


The New College copra drier of the Philippines, another indirect type. 1, temperature control pit; 2, Dutch oven; 3, combustion chamber; 4, smoke stack.

Fiji Bulletin On Copra Driers

Another work of interest in the field of copra drying is a recent Bulletin issued by the Department of Agriculture in Fiji. Written by G. B. Gregory, V. E. Sills and J. A. Palmer, the paper (No. 32) may be studied concurrently with the FAO publication.

Entitled *Copra Driers,* the paper sets



The "Perfect 50" hot air drier, designed and manufactured in Fiji. It is so named because it can produce 50 tons of copra in 50 weeks, operating five days a week. 1, copra tray door; 2, cleaning and inspection door; 3, previous day's copra; 4, light wooden scraper; 5, flat iron turning shovel; 6, lever for adjusting upper ventilators; 7, dial thermometer; 8, firebox doors; 9, ash and ventilator doors; 10, crank handle for running out copra tray.

TABLE SHOWING RELATIONS BETWEEN TEMPERATURE AND CONFLAGRATION OF KILNS

Temperature (C)	Observations
All temperatures:	Oily string, dry husk and attap but not copra can be ignited by direct contact with a naked flame at all normal kiln temperatures.
80°	Top limit of heat below nearly dry copra (3rd day).
100°	Nearly dry copra rapidly scorches.
120°	Top limit of heat below half-dry copra (2nd day).
130°	Non-inflammable gas (mostly water vapour and carbon dioxide) is given off by coconut shells.
140°	Top limit of heat below fresh coconut meat (1st day).
150°	Husk smokes.
160°	Oily string smokes.
180°	Non-inflammable gas given off by copra.
182°	This temperature was recorded under copra in a kiln without a conflagration occurring.
185°	Mixed inflammable gases given off by coconut shell.
200°	Oil begins to exude from scorched copra.
220°	Oily string and husk glow and may ignite spontaneously.
230°	Coconut oil can be ignited immediately on contact with a naked flame.
240°	Inflammable gas given off by copra.
250°	Oil exudes freely from copra.
300°	Copra burns very fiercely but only after contact with a naked flame.

out the principles of copra processing and practical applications and provides the reader with diagrams and photographs of the many types of kilns used.

Like the FAO publication, the Fiji Bulletin features a number of driers which may be found suitable for the small coconut grower.

Among the smaller copra-processing plants the Kukum drier is described briefly. Although not mentioned in the FAO paper, the simplicity of its construction and operation makes it an ideal plant for the smallholder. It should be given serious consideration by those responsible for guiding the development of rural copra-processing industries.

Kukum Drier Easy To Build

"The Kukum drier", state the authors, "is cheap and easy to construct.* It consists of one large flue, made from three 44-gallon drums, joined to a lagged fire-box, which itself consists of a heavy 44-gallon drum lined with concrete, the latter being held in position by a second drum of smaller diameter. The grate is made of steel airfield matting or similar material. All four drums may be joined by welding or the use of iron hoops. At the raised end of the flue a 6″ diameter galvanised pipe leads into a 4-gallon drum, which acts as a soot trap and as a base on which to rest the 12′ chimney.

A 7′ x 9′ drying tray, built of any suitable material, is placed 5′ above the flue. Between this and the flue at the fire-box end it is necessary to have a baffle plate made from a flattened-out drum. . . . Any cheap but robust sort of structure may be built over the drier to protect it from the weather. Cement-dipped sacks can be used for lining the

* An article on the construction of the Kukum drier appears in the *Quarterly Bulletin* for July 1956.—Editor.

TABLE SHOWING COMPARATIVE OPERATING COSTS OF COPRA DRIERS

Name of Drier	Approximate Capital Cost of Drier	Approximate weight of Green Copra	Approximate Drying Period	Annual Output of Dry Copra (300 working days)	Approximate Drying Costs per Ton of Dry Copra Produced					Remarks
					No. of Driers	Labour	Fuel	Depreciation 10 per cent. per annum	Total	
		lb.	hours	tons						
Kukum	£50-£100	750	36	30	1	—	—	—	—	A cheap drier for the small plantations employing little or no labour.
Devo	£150-£200	1,200	30+	40	1	99s.	10s.	10s.	119s.	Fire can be made up at night and left until next morning. Needs careful management. One man can operate 2 or more driers.
					2	50s.	10s.	10s.	70s.	
Perfect "50"	£690	840	22	50	1	148s.	10s.	28s.	186s.	Operator must be in constant attendance. One man can operate 2 or more driers. Copra must be turned regularly.
					2	74s.	10s.	28s.	112s.	
Chula V.N.D.	£820	1,000	24	60	1	122s.	10s.	27s.	159s.	Trays must be moved round occasionally.
					2	61s.	10s.	27s.	98s.	
Chula N.D.O.	£1,210	1,800	24 (continuous)	100	1	68s.	10s.	24s.	102s.	6 trays to be taken out and emptied and 6 loaded trays to be put in every 4 hours.
Chula B.D.O.	£2,585	4,000-4,500	24	250	Oil-fired	13s.	45s.	20s.	78s.	Automatic control.
					Wood-fired	22s.	10s.	20s.	52s.	Fireman must be in constant attendance.
Chula B.D.1.	£3,275	6,500	24	400	Oil-fired					Automatic control.
					Wood-fired	13s.	10s.	16s.	39s.	Fireman must be in constant attendance.
Slade-Curran	£850-£910 (incl. diesel engine)	9,000	24	700	Oil-fired	6s.	45s.	3s.	54s.	Automatic control.
American Driers ..... Model IX	$6,050 (plus duty)	8,000	16-24	600	Oil-fired	6s.	25s.	9s.	40s.	Automatic control. Air recirculation system saves fuel and reduces drying time.
Sun-Driers ("Vatas") 36 trays 16 ft. x 6 ft.	£2,000	7,500	5-10 days	75	—	66s.	—	53s.	119s.	Copra liable to be of poor quality, particularly during unfavourable weather.

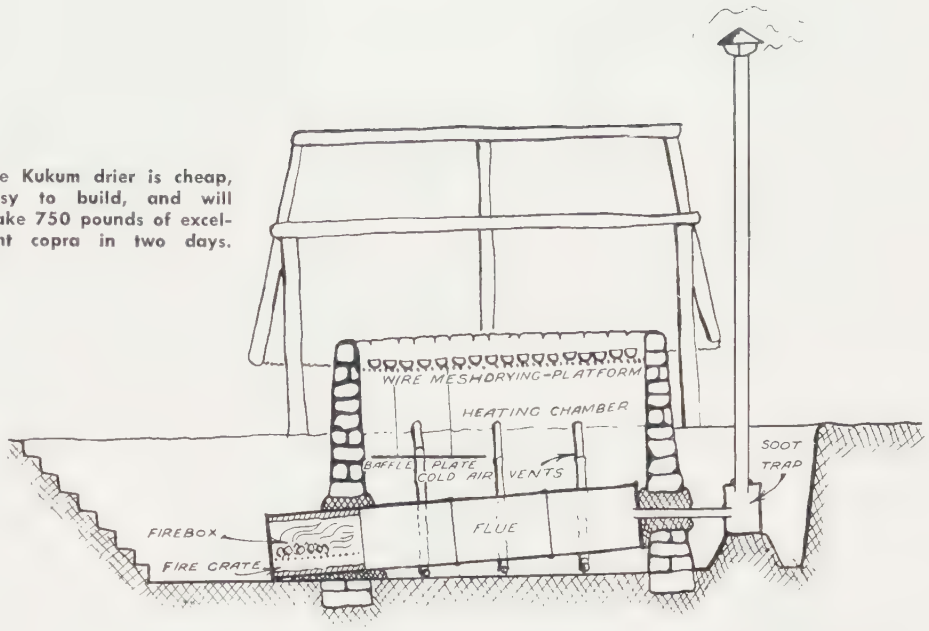
Notes:—1. Labour costs have been calculated from a flat rate of 1s. 4½d. per hour.
2. The price of diesel fuel oil has been taken as 1s. 10d. per gallon.
3. Wood fuels have been costed at 10s. 0d. per ton of dry copra produced.

fire-chamber and are also recommended for covering the roof, since they are cheap and reasonably fire-proof. . . . The output of this drier is given as 750 pounds of dry copra in 2 days."

Under the heading "Principles of Hot-air Drying", the paper contains much sound practical advice on the do's and don'ts of copra processing. How to prevent case-hardening of copra, correct drying temperatures, the moisture content of copra in its various stages of drying and other important factors are subjects discussed both clearly and practically.

Because of its recent compilation, the Appendix covering the capital and production costs of various driers is a statement of value. The Table, Comparative Operating Costs of Copra Driers, complied by the authors, is reproduced here.

COPRA DRIERS. *Principles of Copra Drying and Practical Applications.* By G. B. Gregory, V. E. Sills, and J. A. Palmer. Bulletin No. 32, Department of Agriculture, Fiji. Suva, March 1958. Price 3/- F.



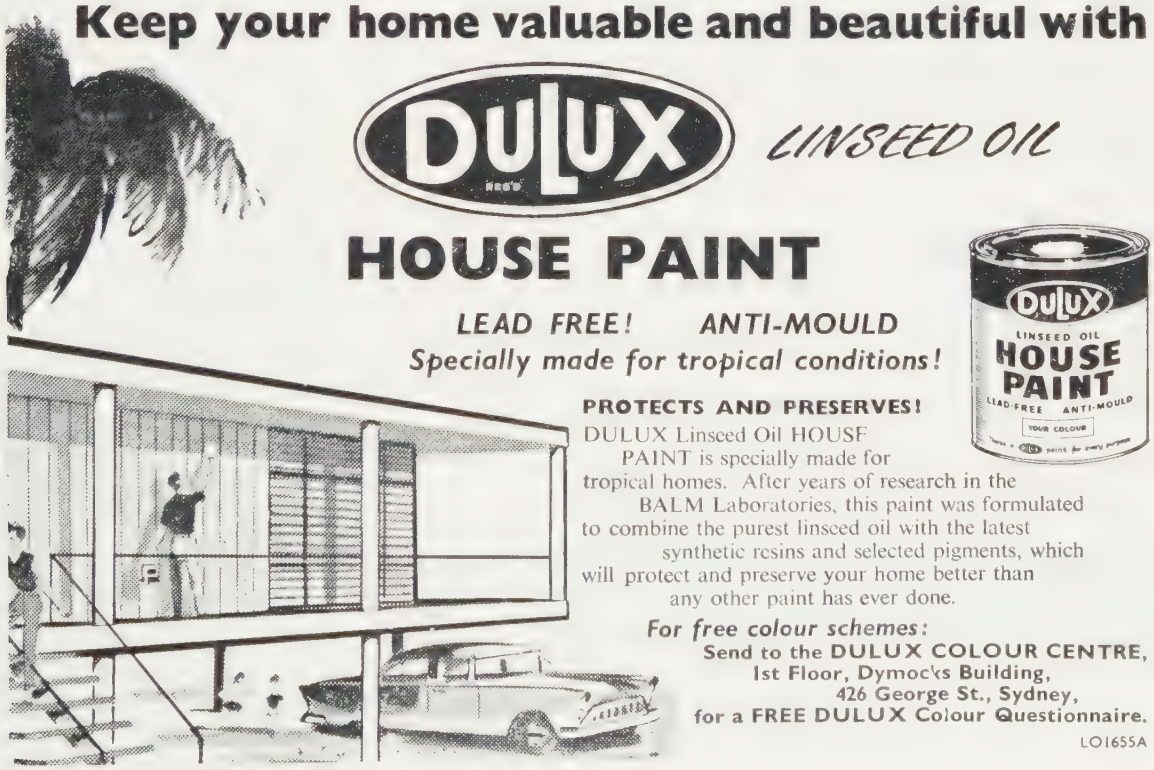
The Kukum drier is cheap, easy to build, and will make 750 pounds of excellent copra in two days.

New Agricultural Co-operative For Guam

A farmers' and egg producers' marketing co-operative, the Guam Agricultural Producers Co-operative Association, has been formed in Guam.

Its main purpose is to assist farmers to exploit fully the large market available for fruit and vegetables. It is hoped that by co-operative planning, total production of all types of fruit and vegetables can be accurately adjusted to consumer demand.

During a recent visit to Guam the Commission's co-operatives officer, Mr. R. H. Boyan, attended many meetings to discuss the formation of the co-operative and the drawing up of articles of incorporation, by-laws, and organizing procedure. Mr. Boyan has just been advised by letter of the appointment of a full-time manager, and of plans to buy a truck.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A Junior Health Reader for the Islands

BECAUSE Pacific islanders do not normally live in communities where habits of healthy living are an accepted part of the social pattern, it is all the more important that these should be taught to the rising generation and form part of their school programmes.

Any attempt to provide such teaching is especially to be encouraged, and Mr. E. P. W. Marriott's *Junior Health Reader* will therefore be warmly welcomed. Just published by the South Pacific Commission through its Literature Bureau, the *Reader* is designed to be sold for around 2/- Aust. per copy. It is a revised version of a reader first produced by Mr. Marriott for the schools of the Anglican Mission in Papua and New Guinea.

That its teaching has strong medical endorsement is guaranteed by the fact that Dr. Gunther, Assistant Administrator, and formerly Director of Public Health of the Territory of Papua and New Guinea, gives it his blessing in a preface.

A feature of the book is that the vocabulary has been limited to about 700 simple words, and this helps to make it an effective means of imparting knowledge to the group of children for whom it is designed, namely, those of about Standard 5 level as this is understood in Papua and New Guinea.

Of necessity the background is Melanesian, and therefore the teaching is not always applicable in other parts of the Pacific or of the world. This is not a fault, however. In every book of this sort, and especially at elementary levels, it is necessary not to confuse the issues by references and information locally irrelevant. Not all doctors and teachers would therefore subscribe to every statement made as complete and comprehensive.

If the local design and purpose of the book is kept in mind, however, and also the fact that it has been subject to assessment by those familiar with New Guinea conditions, criticism can only be minor. Certain it is that those readers who have worked through and comprehended the lessons are likely to be reasonably knowledgeable concerning the subjects covered as one would wish, and a good deal better informed than most laymen, irrespective of race.

Inevitably the book does not cover all aspects of healthy living. Being designed to meet the needs of a syllabus of teaching appropriate to a certain stage of education, and to be completed within a limited time, it could not deal with every subject. But in any future edition the author might consider including something about choice and use of water sources, the importance for health of personal cleanliness, and something about

diet, food selection, and preparation.

Especially could specific teaching on the hygienic handling of food be included. There is much preventable illness in the Pacific caused by the insanitary handling of food, especially at the large communal feasts so common in some areas.

These are, however, only minor criticisms and suggestions. This book can be commended to both education and health authorities in the Pacific.

Beware Of Pesticide Poisoning

(Continued from page 57)

skin can prevent trouble. Aldrin, parathion and malathion, under many trade names, are widely used in agriculture, and must be used with strict observance of precautions.

The first WHO Pesticide Circular issued gives many instances of how accidental poisoning can occur. For instance, in Kenya, seeds previously treated with a parasiticide were subsequently used by mistake for food.

Parathion residues in crops have produced poisoning of agricultural workers in some cases where sufficient time has not been allowed to lapse between spraying and subsequent operations. Weather may influence the occurrence.

There is emphasis in one case of malathion poisoning of the special necessity for close supervision in countries "where the climate and the lack of understanding among workers do not permit the enforcement of adequate precautions." Nine deaths within a period of eighteen months occurred in sawmill workers in Sarawak where pentachlorophenol was used as a wood preservative.

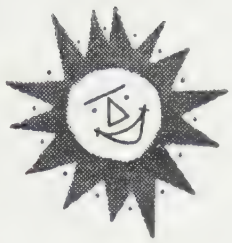
There are the usual crop of bizarre instances recorded in this Circular. A man rubbed his body with an undiluted oily parathion solution for lice control. Although he washed himself after the treatment, he became seriously ill, and was in hospital for sixteen days.

The Scots poet Robert Burns referred to toothache as "the hell o' a' diseases" but it could hardly have justified the action of the woman who put malathion fly spray on an aching tooth and, finding it ineffective, drank the rest, amounting to about 16 oz.!

Fortunately prompt action was taken, and after very active treatment of the grave condition which supervened she eventually recovered.

Finally, the Circular refers to a simple field kit whereby a check can be made on the blood of workers with organophosphorus insecticides (including malathion and parathion) in order to detect dangerous exposure.

The kit was developed in collaboration with Tintometer Ltd. by Dr. E. F. Edson, Head of the Medical Department of Fison's Pest Control Ltd. of Cambridge, England. Such a kit might be a useful addition to hospital laboratories.



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Need For Bamboos Tolerant Of Salinity

By F. A. McCLURE*

STRAATMANS (1954, p. 15)[1] in reporting progress in the reclamation of tidal mud flats in the island of Tonga, states that: "Plantations of bamboo have been started with the two still-unidentified species existing on the island. The 'blue bamboo' appeared to be much more salt tolerant than the 'yellow bamboo'. The results were so promising that plantations on a larger scale have been made, as this useful plant is still in short supply on the island."

This is the first published reference that has come to light indicating that *any* bamboo possesses a noticeable degree of tolerance to salinity.

To this may be added a reference on the ticket (H. H. Bartlett No. 13461) attached to a fragmentary unidentifiable culm specimen of bamboo from Mindoro, P.I.: "brackish water bamboo", deposited in the National Herbarium.

Evidence of the existence of salt-tolerant species of bamboo is still very fragmentary, and documentation as to the species involved is lacking entirely. In view of the interest stirred by Dr. Straatman's observations it seems worth while to initiate field studies and inquiries designed to bring to light bamboos tolerant of brackish conditions and provide specimens for their identification. Such information would be very useful in areas such as Tonga, where there is an obvious need for bamboo in the local economy, and there the land available for bamboo culture is all more or less brackish. There must be many such areas in the South Pacific Commission's region that could be reclaimed economically for bamboo culture.

Anyone who knows of such a bamboo may advance the cause of science, and do a good turn to some community like the one in Tonga, by sending living plants to the South Pacific Commission at Nouméa for trial. The Officer in Charge of Plant Introduction can advise as to best means of preparing, packing and sending the plants. Dried specimens will be identified by the author of this note, if they are accompanied by illustrations of the critical parts of the plant, as exemplified in the photographs on pp. 40-41 of July 1958 number of the *Bulletin*.

Specimens for identification should be sent by ordinary mail to the author at Department of Botany, Smithsonian Institution, Washington 25, D.C.

* Dr. McClure, a leading world authority on bamboos, is consultant in tropical forestry to the Maria Moors Cabot Foundation of Harvard University. He was author of the article *Bamboos For The Pacific Islands* which appeared in instalments in the *Quarterly Bulletin* for April, July and October, 1958.—Editor.

[1] Straatmans, W., *Reclamation of Tidal Mud Flats In Tonga.* SPC Technical Paper No. 53, 18 pp., illus. 1954.

Research Council Holds Tenth Meeting

(Continued from page 25)

the Council considered the relations between the work programmes in economic development, health and social development, more particularly in the fields of nutrition, capital formation, population studies, and aided self-help projects. Furthermore, its report to the Commission contains a number of recommendations in the fields of plant collection and introduction, pests and diseases of plants and animals, extension education, the coconut industry, and fisheries.

This Research Council meeting might well be regarded as one of the best yet held, and the Commission's work in economic development will certainly benefit for many years by its work.

The recommendations of the meeting will be considered by the Commission at its next session, which is expected to begin in Nouméa on October 13.

Rubber Output From Papua Increases Steadily

Output of rubber from Papua has increased by one-third in four years. In 1953-1954 production was 3,145 tons; in 1957-1958, 4,259 tons.

The Australian Government is encouraging rubber growers by guaranteeing them an assured market in Australia as well as assistance in times of low prices. The Administration of the territory is also supplying them with budwood of high-yielding varieties established at its experimental station at Bisianumu.

Nutrition-Economist Visits Micronesia

On June 11 the Commission's nutrition-economist, Miss Manuela G. Maramba, returned to headquarters following a five-week visit to Guam and various islands in the United States Trust Territory. Her main task was to study the availability of foods with a view to suggesting ways of gearing local production to meet the nutritional needs of the Micronesian people.

After spending a week at Trust Territory headquarters in Guam, Miss Maramba visited the islands of Koror, Truk and Majuro. Throughout she worked in close co-operation with the agricultural and health authorities.

Miss Maramba is expected to leave Commission headquarters at the end of July for Papua and New Guinea, where she will spend eight weeks investigating nutritional problems. She will then leave for Netherlands New Guinea, where she will work until mid-December.

PACIFIC READING

Material in this section is contributed by the South Pacific Commission Literature Bureau. Any enquiries relating thereto should be directed to Box 5254, G.P.O., Sydney, Australia.

Notes and News

Recent Bureau Publications. The covers of some recent publications produced by the Literature Bureau in co-operation with the publishers and on behalf of various territories are shown in the accompanying illustration.

The books *Nauru, the Phosphate Island* and *The Story of Nabetari* are new titles in the Bonito series of supplementary readers, produced in association with Longmans, Green & Co. The first-mentioned book, written by G. A. Pittman, Director of Education, Nauru, deals with the discovery and subsequent mining of phosphate rock on this tiny Pacific island, while the latter title, written by E. M. Pateman, describes the epic voyage of a young Gilbertese during World War II. Simply written and attractively illustrated with line drawings, these books should prove useful as supplementary readers at about the 4th-6th year level of English; their subject matter is equally suited to either school or adult reading.

A supplementary reader entitled *Stories from Papua,* by R. M. Gallyon, has just been published by Macmillan & Co. in association with this Literature Bureau. This 40-page book contains twelve stories of the mythical folk lore type, which are always very popular with island readers. The text is well illustrated with clear line drawings, and should prove suitable for either adult use or school reading at about 4th-6th year level of English.

Educationists and booksellers interested in obtaining inspection copies of these books should address their enquiries to the Literature Bureau, Box 5254, G.P.O., Sydney, N.S.W., Australia.

The publication *Piakirikiri Pati* is a small primer in the Nguna language produced by this Bureau on behalf of the Presbyterian Church of the New Hebrides. The text in this 24-page book was hand-lettered and illustrated with simple line drawings by the Bureau's artist; the cover is attractively printed in dark brown ink on a green card, and the binding edge is bound with a dark green cloth.

A Luaina Buk Na Aisin is a vernacular version of the well-known and widely-used *A First Hygiene Book.* This edition, in the Blanche Bay dialect, has been produced for

The covers of some new books recently produced by the Literature Bureau in co-operation with various publishers and on behalf of territories. Details of these publications are given in the accompanying text.

Living in Communities—Book 3

OUR WORLD COMMUNITY

P. B. Hilton & A. Lansdale Tootill

This book is part of a History and Civics Course for older pupils but can stand alone. It is divided into seven topics to do with world organisation: the idea of the world community, education, health, trade, labour, justice, and there is a valuable study of the British Commonwealth.

Illustrated 3s

★

WOODWORK CHARTS

R. Marriott

Sixteen charts, each 21″ x 17″, for boys taking woodwork courses. They illustrate technical matters, such as halving joints, planes and chisels, as well as more general topics—ironmongery, furniture, and timber. *13s 6d the set*

A textbook to accompany the charts is in preparation

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ADAPTED EDITION

VOYAGE TO BENGAL

Capt. Frank Knight

The author has prepared this special simplified edition of his popular and exciting tale for backward readers, and for those for whom English is a second language. *Illustrated 6s*

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PICTURE BOOK READERS 4, 5 & 6

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Three more readers in a series based on *Macmillan's Picture Books*. These lively books offer simple explanations to the questions of junior pupils about the world they live in. *4. Playtime. 5. Holidays. 6. Fairy Tales.*

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the Methodist Overseas Mission at Rabaul. The format and illustrations are the same as for the original English edition, but to avoid heavy typesetting costs, the new text was set up on an electric typewriter. This book is a good example of how existing materials can be readily adapted for use in other areas at a considerably lower cost than that required for a completely new production.

Specimen pages of these books, with details of production costs, are obtainable from the Literature Bureau, Box 5254, G.P.O., Sydney, N.S.W., Australia.

New Fisheries Booklets. The booklets *How to Look After a Fishpond* and *How to Look After Fishnets,* referred to in "Notes & News" for October last, have now been completed. These books have been produced in a format similar to the already widely-known *Fish Preservation Simplified* and are available in either an English or French edition, price A.1/- plus postage.

How to Look After a Fishpond describes the construction, stocking, management and maintenance of a fishpond suitable for the raising of tilapia, a species of edible fish introduced to the Pacific several years ago (mainly by the South Pacific Commission's fisheries officer) to provide a new source of protein for islanders. *How to Look After Fishnets* deals firstly with the cleaning, drying and storing of nets, and then describes a simple but effective method of preserving a net by using a tanning solution.

In each book the text is simply written and well illustrated with two-colour line drawings, and should be suitable for either adult reading or school use.

Orders for these books should be forwarded direct to the South Pacific Commission Literature Bureau, Box 5254, G.P.O., Sydney, N.S.W., Australia.

Peter and Seiva—A True Love Story. One of the problems facing many island communities is the provision of suitable reading materials for new literates who have completed a primary school education. *Peter and Seiva* represents a serious attempt by the Literature Bureau to meet the needs of these peoples, who are generally seeking more sophisticated literature than the usual school text material. This narrative, based on fact, is an adventuresome love story between a half-caste youth of 19 years and an island girl of about 17 years, the setting being on an atoll in the Pacific. Although the love and friendship of Peter and Seiva run smoothly, a third party, together with custom and tradition, compel a separation of the couple under dramatic circumstances. It is on this theme that the book finishes. However, if there is sufficient interest shown in this initial venture, it is proposed to continue the story in a sequel.

At this stage, *Peter and Seiva* has been produced only in a small experimental edition, and these copies are being sent to selected areas and groups in the Pacific to determine just how wide an appeal such a book will make among Pacific islanders, and—perhaps of more importance—if islanders generally are prepared to buy such books.

Apart from its value as young adult reading material, however, we think that territorial administrations, missions and others will be interested in this book as an example of the possibilities and scope of modern low-cost printing techniques for the provision of island reading material. Attractively produced with a two-colour (black and turquoise blue on a white background) cover, the book contains 72 pages, measuring 6″ x 8½″. The text has been set up on an electric typewriter and is illustrated with nineteen black-and-white

line drawings prepared by the Bureau's artist.

We shall welcome enquiries about this book and can, on request, provide details of costs of it and similar productions.

Peanut Growing Booklet. Three versions — English, Motu and Pidgin — of a 16-page booklet entitled *Let's Grow Peanuts* have just been produced by the Literature Bureau in co-operation with and on behalf of the Department of Agriculture, Stock and Fisheries, Port Moresby. In this instance the various texts and illustrations were prepared by the Department of Agriculture and the Bureau arranged all production details. The main purpose of this book is to encourage the local people to grow more peanuts, either for food or as a source of extra income, and it describes in simple language the correct method of planting, harvesting and marketing the peanut crop. In addition, suggestions on the cooking of peanuts for food are included.

This book is another example of small-book production using the multilith offset process. In order to keep production costs down, the text for each edition was typed direct onto duplimats using an electric typewriter; each layout was then arranged so that the over-printing of the two-colour illustrations, common to all editions, could be done from a single set of plates, thus enabling a considerable saving in costs to be effected.

Single specimen copies of this booklet with details of production costs are available from the Literature Bureau, Box 5254, G.P.O., Sydney, N.S.W., Australia. We shall also welcome enquiries from any territories interested in the production of similar booklets.

Books About the Pacific. Although book reviews are now mainly confined to our book news sheet, *Some Recent Acquisitions,* we think that the following brief details of three books dealing with the Pacific area should be of considerable interest to our readers.

THE GREAT SOUTH SEA, by Roger Pilkington. Macmillan & Co. Ltd., London. 120 pages. A.11/-.

This small book contains eight chapters which give a very good survey of the Pacific Ocean in pleasant, fairly easy-to-read language. The first two chapters give a description of the discovery and subsequent exploration of the Pacific by the early European sailors. Then comes an account of the evolution of the earth, the formation of rocks, the rise of volcanoes, the nature and growth of coral, and the changing nature of our earth's crust. The growth of various types of islands is outlined, and the book finishes with a measure of praise for the early missionaries, both European and islander.

BRITAIN IN FIJI (1858-1880), by J. D. Legge. Macmillan & Co. Ltd., London. 307 pages. A.34/9.

The first half of this well-documented book traces the politics of Fiji from the first offer of Cession in 1855 by Tui Levuka, Chief of Ovalau, up to the final Deed of Cession on 10th October, 1874, when Robinson accepted the territory and established himself as Governor.

It would seem that the final cession was made unconditionally by the Chiefs of Fiji, although there is much evidence to prove that they believed Great Britain would protect their rights and respect their customs.

The second half of the book expounds the enlightened policy of Sir Arthur Gordon whose administrative gifts combined with an academic turn of mind saved Fiji from sudden and disruptive changes, helped to preserve her customs and to build a system acceptable to its own people. Viewed in the light of present-day Fiji, the work of Gordon becomes a fascinating story for historians, anthropologists and others.

OXFORD ENGLISH COURSES

FIRST READING BOOKS

A new series of supplementary readers is now being produced for use in conjunction with the *Oxford English Course for Papua and New Guinea.* The first two books in this series are:

WHY COCKS CROW 3/-

TUI LIKU AND THE GIANTS 3/-

The vocabulary of these 48-page books is based on the words learnt in the *First Book, Second Book,* and *Third Book* of *Oxford English Course for Papua and New Guinea,* and the stories in them have been chosen from various regions of the southern Pacific area.

UNDER THE MANGO TREES 2/-

This is the story of Dinah Frank of Rogea, the first of a series of short lives of outstanding men and women from Papua and New Guinea. They are being produced in close collaboration with the area Director of Education.

The need for a new series of supplementary readers arises in changes of fashion no less than in methods of teaching English as a foreign language. Since one of the purposes of supplementary readers is to get students interested in reading, they need to be attractively printed in a large type and with plenty of illustration. *The New Oxford Supplementary Readers* will satisfy these new conditions, but at the same time retain the important principles of existing series.

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A PRESENT FOR MOTHER 1/-

THE OLD WOMAN AND HER COCK 1/-

SHALL WE MEET THE LION? 1/-

All prices are quoted in Australian currency

OXFORD UNIVERSITY PRESS

346 LITTLE COLLINS STREET MELBOURNE

THE COOK ISLANDS, by R. G. Crocombe. N.Z. School Publications Branch, Department of Education, Wellington, N.Z. "About the Pacific" Series. 36 pages.

The author of this book, R. G. Crocombe, has had several years' experience working among the Cook Islands Maoris, and his descriptions of village life are intimate and accurate.

The Government of the Islands is described. One chapter is devoted to the school system, while trade and the problems of supplying adequate transport between the Group and New Zealand, and among the Islands themselves, are well covered. The chapter "Earning a Living" describes the various current industries offering employment, and also anticipates the future industry of milling case timber from the afforestation schemes already in progress. Co-operatives, too, are mentioned.

Church, social events, sports each command a chapter. The final optimistic chapter, though short, is full of hope for the Cook Islanders of tomorrow.

Reprint — Timber House Construction Booklet. In response to many requests, a reprint of the book *Simple Methods in Timber House Construction* has now been completed. This 28-page handbook of basic house building techniques was prepared originally by the Cook Islands Social Development Department for its own use, but as the textual matter is in no way localized the information given is equally applicable to most other areas of the Pacific. The book contains nine chapters, and deals with (1) Setting out the Building; (2) The Foundations; (3) The Concrete Floor; (4) Timber Wall Framing; (5) Assembling the Wall Frames; (6) Ceiling Framing; (7) Roof Framing; (8) Windows and Doors; (9) Wall Linings.

The text has been kept as simple and as non-technical as possible, and is well illustrated by clear line drawings. Copies of this publication are available from the Literature Bureau, Box 5254, G.P.O., Sydney, N.S.W., Australia, price A.3/- per copy, plus postage.

Cook Islands Co-operatives Manual. A small handbook entitled *Co-operation for the Maori of the Cook Islands* has been issued by the Registrar of Co-operative Societies, Rarotonga, Cook Islands. When the co-operative movement was introduced officially to the Cook Islands it was decided to teach the simple principles of co-operation to the pupils in the senior classes at school. But first of all the Maori teachers themselves had to be taught. Teachers' classes were organized, Training College students were taught, and a syllabus and lesson material drawn up.

This material has now been produced in book form and it should, we feel, prove invaluable to the many people in various Pacific territories who are being charged with the instruction of islanders in the methods, principles and aims of the co-operative movement.

The information in this book is conveniently grouped into ten main sections. The topics covered are: (1) The Growth of Economic Life; (2) How Co-operation Began and How it Grew; (3) The Rules of Co-operation; (4) The Co-operative Societies Law; (5) How Societies are Managed; (6) The Community; (7) How a Village Society Starts; (8) How a Village Society Lends Money; (9) How a Village Society Educates Members in Simple Business; and (10) How a Village Society Leads to Other Things.

The text is illustrated with black-and-white line drawings prepared by a local Cook Islander, Ta Harry, and two photographs of the movement in Rarotonga are included. Any enquiries concerning this book should be made direct to the Registrar of Co-operative Societies, Rarotonga, Cook Islands.

TECHNICAL ENGLISH PREPARATORY

G. A. Pittman

The Students' Book is divided into *Situations* which contain explanations with line drawings of exercises and some reading passages. The Teachers' Guide contains instructions on the planning of the course and detailed notes covering each situation.

This new course, consisting of a Students' Book and a Teachers' Guide, aims to provide a basic working knowledge for apprentices and technical students whose mother tongue is not English and whose immediate need is for "technical" as saying and writing what they are doing, sets of sections in which the students obey instructions, all the words and structures involved, "action" opposed to "literary" English.

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Wealth From The Coconut

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Simply written and well illustrated with 33 two-colour line drawings, this book describes practical methods for improving the quality and yield of existing coconut plantations in the Pacific Islands.

TOPICS DISCUSSED INCLUDE:

Selection of Mother Palms; Selection of Seed Nuts; Coconut Nurseries; Selection of Seedlings; Planting Distance and Preparation of Seedling Holes; The Transplantation and Care of Transplanted Seedlings.

Copies of either English, French, Fijian, Samoan, Tongan, Pidgin, Maori (Rarotongan) or Malayan language edition are available through your local bookseller.

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South Pacific Commission Technical Papers

Copies of Technical Papers, which are published both in English and French editions, may be procured from the South Pacific Commission, Nouméa, New Caledonia, or G.P.O. Box 5254, Sydney, Australia. Except where otherwise stated, price per copy, post free by surface mail, is 2/- stg. (2/6 Aust., 2/3 Fijian, 30 cents U.S., 1 New Guinea guilder)*.

NUTRITION

18. **Report on Nutrition Investigations by the South Pacific Commission in 1950.** November 1951.
22. **Chemical Composition of the Milk of New Hebridean Mothers.** F. E. Peters, biochemist, South Pacific Commission. February 1952.
23. **Nutrition Research Conducted in New Hebrides during 1951.** Sheila Malcolm, nutritionist, South Pacific Commission. April 1952.
50. **Nutrition Investigation in New Caledonia.** Sheila Malcolm. October 1953.
63. **Diet and Nutrition in American Samoa.** Sheila Malcolm. August 1954.
83. **Diet and Nutrition in the Trust Territory of the Pacific Islands.** Sheila Malcolm. July 1955.
85. **Etudes sur la Nutrition et l'Alimentation dans les Etablissements Francais de l'Oceanie** (Summary and Conclusion in English). Sheila Malcolm. April 1955.
95. **Bibliography of the Nutritional Aspects of the Coconut** (revised edition of T.P. 58). F. E. Peters. September 1956.
100. **Chemical Composition of South Pacific Foods**—An Annotated Bibliography. F. E. Peters. January 1957. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
106. **Some Food Problems In The Pacific Islands.** H. S. McKee. May 1957.
113. **The Diet of Mothers and Children on the Island of Guam.** Sheila Malcolm. January 1958.
115. **The Chemical Composition of South Pacific Foods.** F. E. Peters. January 1958.
118. **Nutrition and the Papuan Child.** H. A. P. C. Oomen and S. H. Malcolm. April 1958. (8/- stg., 10/-A., 9/-F., $1.20, 4G.)

PUBLIC HEALTH

12. **Tuberculosis Investigations by the South Pacific Commission in 1950.** May 1951.
24. **A Survey of Leprosy on the Island of Nauru.** Dr. C. J. Austin, Director, Makogai Leprosy Hospital, Fiji. April 1952.
27. **A Survey of Leprosy in the British Solomon Islands Protectorate.** Dr. C. J. Austin. July 1952.
56. **Leprosy in Netherlands New Guinea.** Dr. Norman R. Sloan. April 1954.
57. **Leprosy in the Trust Territory of the Pacific Islands.** Dr. Norman R. Sloan. April 1954.
62. **Leprosy in American Samoa.** Dr. Norman R. Sloan. July 1954.
64. **Dental Conditions in School Children of American Samoa.** Dr. Raymond G. Neubarth. August 1954.
67. **Ophthalmological Survey of the Trust Territory.** Dr. H. E. Crawford. September 1954.
69. **Leprosy in Western Samoa and the Cook Islands.** Dr. Norman R. Sloan. October, 1954.
96. **Health Education In The South Pacific.** G. Loison and L. L. Keyes. September 1956.

MOSQUITO-BORNE DISEASES

17. **Conference of Experts on Filariasis and Elephantiasis, Tahiti: Summary of Proceedings.** September 1951.
33. **A Survey of Malaria in the British Solomon Islands Protectorate.** Dr. R. H. Black, School of Public Health and Tropical Medicine, University of Sydney. November 1952.
60. **Some Aspects of Malaria in the New Hebrides.** Dr. R. H. Black. May 1954.
61. **Malaria in the Trobriand Islands.** Dr. R. H. Black. May 1954.
65. **Annotated Bibliography of Filariasis and Elephantiasis.** September 1954. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
66. **Distribution of Filariasis in the South Pacific Region.** Dr. M. O. T. Iyengar. September 1954. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
68. **Malaria in the Torres Straits Islands.** M. Josephine Mackerras and Dorothea F. Sandars. October 1954.
80. **Malaria Control and Research in Netherlands New Guinea.** Dr. R. H. Black. March 1955.
81. **Malaria in the South-West Pacific.** Dr. R. H. Black. March 1955.
86. **Distribution of Mosquitoes in the South Pacific Region.** Dr. M. O. T. Iyengar. 1955. (8/- stg., 10/-A., 9/-F., $1.20, 4G.)
88. **Annotated Bibliography of Filariasis and Elephantiasis. Part 2.** Dr. M. O. T. Iyengar. Jan. 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
104. **Developmental Stages Of Filariae In Mosquitoes.** Dr. M. O. T. Iyengar. May 1957.
105. **An Investigation On Filariasis In The Berau Region.** H. de Rook. May 1957.
109. **Annotated Bibliography of Filariasis and Elephantiasis. Part 3.** Dr. M. O. T. Iyengar. July 1957. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
110. **Enquete epidemiologique et entomologique sur la Filariose de Bancroft en Nouvelle-Caledonie et dependances.** M. Lacour et J. Rageau. (With Summary in English). August 1957.
117. **La repartition geographique des moustiques en Nouvelle-Caledonie et dependances.** J. Rageau. Mars 1958. (Available in French only).
119. **Enquete entomologique sur le Paludisme aux Nouvelles-Hebrides.** Jean Rageau et Guy Vervent. Janvier 1959. Available in French only. (25 francs CFP.)

TROPICAL CROPS

31. **Cocoa Plantation Management in Western Samoa.** D. R. A. Eden, General Manager, New Zealand Reparation Estates, and W. L. Edwards, Assistant General Manager. October 1952.
36. **Cocoa Growing in Fiji Islands.** D. H. Urquhart, former Director of Agriculture, Gold Coast. December 1952.
37. **Cocoa Growing in Netherlands New Guinea.** D. H. Urquhart. January 1953.
38. **Coffee Growing in New Caledonia.** D. H. Urquhart. January 1953.
39. **Cocoa Growing in Western Samoa.** D. H. Urquhart. January 1953.
40. **Cocoa Growing in New Hebrides.** D. H. Urquhart. January 1953.
48. **The Management of Coconut Plantations in Western Samoa.** D. R. A. Eden. September 1953.
82. **The Manufacture of Copra in the Pacific Islands.** W. V. D. Pieris. July 1955. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
87. **L'agriculture vivriere autochtone de la Nouvelle-Caledonie,** par Jacques Barrau; precedee de l'organisation sociale et coutumiere de la population autochtone, par Jean Guiart. Janvier 1956. Available in French only. (20/- stg., 25/-A., 22/6F., $3.00, 10G.)
94. **Food Plants of the South Sea Islands.** Dr. E. Massal and Jacques Barrau. September 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
97. **Rice Production In The South Pacific Region.** R. Watson. October 1956.

PESTS AND DISEASES OF PLANTS AND ANIMALS

9. **Report of Plant and Animal Quarantine Conference, Suva.** April 1951.
34. **Rhinoceros Beetle Control in the Kingdom of Tonga.** L. J. Dumbleton, Plant and Animal Quarantine Officer, South Pacific Commission. November 1952.
77. **A List of Diseases and Parasites of Animals Recorded in the South Pacific Territories.** Bilingual. December 1954.
78. **A List of Plant Diseases Recorded in South Pacific Territories.** Bilingual. December 1954.
79. **A List of Insect Pests Recorded in South Pacific Territories.** Bilingual. August 1955. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
101. **Parasites And Predators Introduced Into The Pacific Islands For The Biological Control Of Insects And Other Pests.** L. J. Dumbleton. March 1957.
107. **The Rhinoceros Beetle In Western Samoa.** R. A. Cumber. June 1957. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)
116. **Contribution a l'Etude des Cochenilles d'Interet Economique de Nouvelle-Caledonie et Dependances,** par F. Cohic. Fevrier 1958. Available in French only.

ECONOMIC CONDITIONS

54. **The Pacific Islander and Modern Commerce.** V. D. Stace, Assistant Economist, Reserve Bank of New Zealand. March 1954.
89. **Small-Scale Industry for the South Pacific—Preliminary Papers.** Cyril S. Belshaw. March 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)
90. **Industrial Activity in Selected Areas of the South Pacific.** K. H. Danks. March 1956. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
91. **Western Samoa—An Economic Survey.** V. D. Stace. June 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
92. **Economic Aspects of the Coconut Industry in the South Pacific.** E. J. E. Lefort. September 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)

CURRENT RESEARCH

29. **Current Research in the South Pacific in the Field of Economic Development.** July 1952.
43. **Research in Queensland in Tropical Plant and Animal Industries.** Jacques Barrau, Technical Officer, South Pacific Commission. May 1953.
98. **Social Science Research In The Pacific Islands.** November 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)

* **Abbreviations used in the above list for the currencies quoted are: stg. (sterling): A (Australian): F (Fijian): $ (United States dollars): G (New Guinea guilders).**

(Continued from outside back cover)

102. **Index Of Social Science Research Theses On The South Pacific.** April 1957. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)

CO-OPERATIVES

1. **The Co-operative Movement in the Gilbert and Ellice Islands.** H. E. Maude. February 1949.
42. **The Co-operative Movement in Papua and New Guinea.** Prepared by the Registry of Co-operative Societies, Port Moresby. February 1953.
51. **A Bibliography of Co-operation in the South Pacific.** December 1953.
75. **Catalogue of the Commission's Co-operative Library** (Bibliography of Co-operation). January 1955. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
120. **A Guide to the Marketing of Copra in Primary Co-operative Societies.** C. G. Joannides. January 1959.
121. **Catalogue of the S.P.C. Co-operative Library** January 1959. (Revised edition of T.P. 75.) (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
123. **Co-operatives in the South Pacific.** (Report of the SPC Technical Meeting on Co-operatives held at Port Moresby July 21-August 1, 1958.) February 1959.

COMMUNITY DEVELOPMENT

2. **Community Development.** March 1950.
11. **Interim Reports on the Moturiki (Fiji) Community Development Project.** Howard Hayden, Director of Education, Fiji. May 1951.
26. **Further Education in the Cook Islands.** P. F. Henderson, Officer for Further Education, Cook Islands. July 1952.
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